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The Role of Management

AN authoritative statement of the role of management in the economy of the country was made recently by Sir Ernest Lever, Chairman & Chief Executive of Richard Thomas & Baldwins Limited and the Steel Company of Wales Limited. The conception, he said, so often held of management as boards of directors squandering profits derived from excessive prices on rich investors instead of putting them back into the business must go, as must the equally false idea of hard and remote executives indifferent to the fact that millions of workpeople depended on their decisions. Sir Ernest Lever's remarks will remind those managers who have feared to find themselves turning into a species of civil servant that there is still a place in the business for the man of enterprise, and that wider horizons are now opening for such men as Government controls of industry fall away. There has been a tendency in some quarters to regard industry as a sphere of egalitarianism, with the enterprising taxed down to the level of the humdrum and the ambitious considered as an anti-social class. The more liberal spirit which is replacing these attitudes is illustrated by the remarkable spread of the spirit of partnership in industry since the war. There are now many bodies at both national and regional levels on which the trade unions and management are both represented and much has been done in this direction on the railways in the form of joint consultation. There is

appreciation on both sides that industry is no longer composed of "we" and "they," but of two parts which make a corporate whole. This new realisation has resulted in great strides being taken in the field of labour-management co-operation. It is claimed by some that management itself is in many ways of better quality than it has ever been, as the efforts of such bodies as the Institute of Management to improve the all-round knowledge and status of the manager are beginning to bear fruit. Real management, Sir Ernest Lever declared, is an artistic creation. The word "adventure" should figure largely in our thinking. If enterprise and initiative are to be encouraged they must be rewarded adequately. Management must be seen clearly as the guiding partner in the advance of the new industrial democracy.

Lodging Turns

A STATEMENT issued by the Western Region, the substance of which is given in our Staff & Labour columns this week, contains pertinent facts on lodging turns and particulars of the amenities for enginemen at the hostel at Old Oak Common, one of the depots affected by the strike of footplate crews in the Region. It is clear that the men—by no means the only railway staff called on from time to time to lodge away from home—have scant cause for complaint. On an average the frequency throughout the Region is about one night away in ten days. If a man has to spend two or three nights away in one week he will not find himself engaged on a similar turn of duty again without due interval. Lodging turns are shown to be fewer than one per cent of the total number of turns of duty. Eight Western Region motive power depots are concerned in the strike. It is to be hoped that the statement will be conducive to a more reasonable attitude on the part of this minority of enginemen before the strike spreads further within the Region or even outside it. The lodging turn has long been recognised as necessary to efficient and economical working and its inconveniences have been reduced to the minimum by the agreements between the railways and the unions.

Traders' Traffic Conference Congress

THE hope that the greater freedom given to the railways would be wisely used in the joint interests of the railways and of trade and industry was expressed by Mr. H. R. Caulfield-Giles, Chairman of the Traders' Traffic Conference, at the Congress which the Conference held last week at Southampton. He appealed for all concerned to lift transport out of the political whirlpool and for it to be given a period of stability in the national interest and left to those who had a lifetime's experience in it—a plea which has the more force in being voiced near to the great system of docks built up by the private enterprise of the L.S.W. and Southern Railways. Mr. Caulfield-Giles was proposing the toast of the guests, which was responded to by Mr. R. P. Biddle, Docks & Marine Manager, Southampton, who was responsible for entertaining the delegates. The party visited the King George V Dock, enjoyed a trip down the Solent to the Fawley Refinery, and lunched aboard the British Railways cross-Channel vessel *Falaise*. Representatives of British Railways, British Road Services and local organisations attended a dinner, at which both Mr. Biddle and Mr. L. W. Cole, Secretary of Babcock & Wilcox Limited, spoke.

Overseas Railway Traffics

GOLD Coast Railway receipts for March were £330,792, a decrease of £67,967 compared with March, 1953. The aggregate for the year ended March 31 was £4,184,420, against £4,040,401 for the year 1952-53. Midland Railway of Western Australia railway and road service receipts for February were £63,052, compared with £54,492 for February of last year, and £59,871 for January, 1954. The aggregate for the eight months from July 1 is £475,730, against £438,874 for the corresponding period of 1952-53. Costa Rica Railway traffics for April were colonies 1,406,704, compared with 1,489,468 last year and with

1,676,060 for March. The aggregate receipts from July 1 to April 30 are colones 14,914,772, against 14,478,536 for the corresponding eight months of 1952-53. The February receipts of the Salvador Railway Company were colones 267,000 and the total from July 1, colones 1,786,000; the corresponding figures for 1952-53 were 250,000 and 1,739,400 respectively.

Servicing Diesel Passenger Trains

THIRTEEN of British Railways new two-car diesel trains described in our May 7 issue are to work in West Cumberland. Their introduction involves special facilities for repairs and examination. At Workington motive power depot, in the London Midland Region, part of the shed is to be converted to service the diesel units. It will undertake major repairs to and examination of all the 13 trains, though only three are to be shedded here, with 23 steam locomotives. The engine pits will be provided with fluorescent lighting, new office accommodation will be built, and a new roof to cover the shed. For steam traction requirements, work is in progress on installing a coaling plant to deal with some 500 tons a week and replace the present coaling by hand, and a new ashpit has been provided. The special facilities for the new diesels at smaller centres such as Workington would seem to be costly in relation to the relatively few diesel units concerned, and also, perhaps, to present some staffing difficulties. It will be interesting to know in due course what maintenance equipment is being provided, and how any difficulties are being overcome.

Railway Research in India

IN September, 1952, the Research Section of the Central Standards Office of the Indian Railway Board was reorganised as a separate directorate of the board with headquarters at Lucknow and sub-centres at Lonavla and Chittaranjan. At the Lucknow centre all railway investigation work carried on simultaneously at the sub-centres and at over 20 other places, including the National Laboratories is directed and co-ordinated. Study of the various aspects of railway working, including operational problems, amenities for railway traffic and, in particular, measures to prevent accidents, increase safety precautions and secure economy is undertaken at Lucknow. Research upon fuel, the dynamic effects of vehicles on track and bridges, the riding qualities and performance of locomotives and rolling stock assembly and components also is conducted there. To assist and permeate all these activities a Documentation and Information Service is established and issues bulletins and summaries of important research in India and abroad. At Lonavla, building, foundation, and soil mechanics problems and concrete developments are dealt with, and at Chittaranjan chemical and metallurgical investigations on paints, water softening, lubricants, metals and metal processing are carried out.

Lucknow Research Centre

TO house the research activities at Lucknow a new research station was opened on February 12, 1954. It includes a main building covering 30,600 sq. ft. of ground area and its construction cost £56,250. Accommodation is provided for the offices of the field units, model room, testing laboratories and workshops, administrative offices, a meeting hall, library, documentation, and photographic laboratory. A rest house for visiting railway staff is also provided. There is besides a mixed-gauge research yard constructed at a cost of nearly £47,000. This accommodates test units and their attendant staff coaches; namely, one broad-gauge hydraulic dynamometer car, three oscillograph units—also adaptable as metre-gauge—a fuel test car, and a track-recording car. Also, for the metre gauge, one hydraulic dynamometer car and a fourth oscillograph unit are on order, and one of the oscillograph units has been experimentally improvised for dynamometer trials on metre-gauge locomotives. In the research yard there is ample length and shedded accommodation for carrying out

impact tests on coaches and wagons. There is also a "squeeze"-test frame for static testing of full-size carriage and wagon underframes and integral shells, both broad and metre gauge.

Power Interlocking at Hanover

EVEN before the war the railway layout at Hanover had become inadequate for the traffic passing through and a thorough rearrangement was found essential. These difficulties increased after hostilities ceased and improved signalling became imperative. A new relay interlocking installation at the east end of the station has been brought into service representative of the latest such development in Germany. It controls 537 routes, of which 110 are for running movements, with independent shunt signals, now increasingly used in this part of Europe, eliminating the familiar point indicators. This has resulted in much speedier traffic operation, and the number of cases of points being taken irregularly trailing has greatly decreased. As is customary in Germany, the working of the area is under the control of a supervisor with his own desk panel from which he gives orders, either to the signalmen in the same box, stationed on the floor below, or to those in other signalboxes in the limits placed in his charge. Route setting is used, depression of a couple of push buttons being sufficient to set up a route and clear the signals for it after receiving the release from the supervisor. Much of this represents a considerable change from practice in Germany and neighbouring lands.

A Combination of Defects

THE derailment to the Bradford-Bristol express between Wilnecote and Kingsbury on August 16, 1953, was due to a combination of circumstances, partly in the track, partly in engine and tender, which, as now and again occurs, acted together at a critical moment to cause a wheel to cross the rail. The case was inquired into by Colonel W. P. Reed, a summary of whose report appears in this issue. He found none of the defects to be dangerous in itself, although at two places track conditions were such that, if not dealt with fairly soon, some real risk would have arisen. Alterations in cross level had been allowed to develop which came to coincide with the hunting period of the engine travelling at the speed just then obtaining. Fortunately the accident was not attended with serious casualties. A feature of it was that the enginemen's evidence could not be reconciled with the physical evidence disclosed by an examination of the track, although they adhered to it when recalled for that to be pointed out to them. Colonel Reed had suggested to him a theory on the origin of the derailment, involving jamming of a bogie bolster, but could find no evidence convincing to himself in support of it and he presents in some detail his own ideas as to the most likely course of events. He considers that certain of the engine faults should have been checked and corrected and more frequent weighing desirable, to ensure timely attention to broken, weak or maladjusted springs. It might be better also to change tender brasses more often, to prevent undue lateral axle play.

New Southern Region Diesel-Electric Locomotive

THE Brighton Works of the Southern Region, British Railways, has completed a 2,000-h.p. diesel-electric, main-line locomotive, which is described and illustrated elsewhere in this issue. The locomotive, No. 10203, is similar in some respects to diesel-electric locomotives Nos. 10201 and 10202, details of which were given in the March 9, 1951, issue of *The Railway Gazette*, and is a further implementation of a plan approved by the board of the former Southern Railway Company with the object of eliminating steam traction on the south eastern lines of the system. Details of the scheme were given in the November 8, 1946, issue of this journal. Features similar to the previous diesel-electric locomotives include the bogies, which are almost identical, and the air brake equipments, while the vacuum brake equipment differs only in the type

of exhausters, which in this case consists of two Reavell rotary machines motor-driven and arranged for two-speed control. As previously, welding has been extensively used in the building of the underframe, while the superstructure is both riveted and welded, and similar in exterior appearance. The diesel engine is a 16-cylinder vee-form, four-stroke, pressure-charged engine supplied by the English Electric Co. Ltd., and is the latest version of the firm's 10 in. x 12 in. "RK" and "VT" series.

Impressions of the Congress

FROM the technical aspect there can be no doubt of the value of the Sixteenth International Railway Congress, held at Church House, Westminster, which rose last Wednesday after seven days' useful and varied activity. It is too early to attempt to appraise the work of the five Sections—the record of their final proceedings was barely available as we went to press—but it is clear that the discussions of the questions afforded the delegates of all the railways concerned, including those from systems in Asia and Africa, opportunities of exchanging views and information which they are unlikely to have before the next Congress in four years time.

All the questions were such as to interest all the railways which sent delegates. At this Congress the number of questions was reduced to 11, which made the agenda more manageable; but the scope of most of the questions was so large that each Section could without difficulty have considered only one. As it is, four Sections have discussed two questions each, and one, the General Section, three questions. For the first time, radiophonic communications in railway working has been on the agenda, and proved to be a subject of interest to railways differing widely in character in many different countries. Various factors, such as the necessity to move heavy loads up steep grades or over long sections of single line, make 50-cycle and other systems of electric traction of some degree of interest to railways with light traffic which two or three years ago would hardly have dreamed of electrification. This relevance of the questions to all the railways concerned added much to the value of the discussions.

The impression chiefly gained from attendance at the plenary sessions and sectional meetings and major functions and from the many technical visits and excursions is one of efficiency without fuss. This in contrast with some previous sessions. Credit for this is due to two elements in the organising staff of the Congress. The secretariat of the International Railway Congress Association, under Monsieur P. Ghilain, Secretary General of the International Railway Congress Association, normally located in Brussels, has been mainly responsible for the agenda, publication of the reports, and other matters connected with the proceedings of meetings; and Mr. J. L. Harrington, Chairman of the Arrangements Committee of the British Organising Commission, Mr. C. E. Whitworth, English General Secretary, and others have made the arrangements in Westminster and arranged the liaison with the secretariat in Brussels and with British Railways and London Transport and the many other bodies concerned, for instance, in arranging excursions and evening functions. Thanks are due also to British Railways, to the Pullman Car Company, to London Transport, to the civic heads who welcomed delegates who visited their communities on their excursions, to the hoteliers and caterers in London and elsewhere, and to many others concerned. The extent of the good impression made by the smooth working of the arrangements is shown in the speech at the dinner to delegates given by the British Transport Commission on Tuesday night, when Monsieur Marcel de Vos, Chairman of the International Railway Congress Association, was at pains to remark on the apparently effortless efficiency. This success is the result of careful organisation and much hard preparatory work. The procedure largely followed in making the preparatory arrangements in London was to hold early meetings between those principally responsible; the detailed work was put into the hands of small committees. This decentralisation obviously has worked very well. The part played by the several

Regions of British Railways in ensuring the success of the visits and excursions has been large. Several delegates have remarked on the smooth organisation of the technical visits, when they were shown over busy plants without ado or interruption to the work in hand. Care was taken to run the various special trains for delegates on fast schedules—a remarkable feat in view of the heavy traffic already passing on most of the lines concerned, which may have escaped the notice of railwaymen from other countries unaware of the traffic densities obtaining in Britain. Besides this, difficulties were overcome. Thus despite the dispute with engine crews in the Western Region over lodging turns, which was beginning last week, the special train was run and improved on its schedule. Similarly, the return journey from Scotland of one excursion party was made with a run on which much time was made up after engine failures. The British Transport Commission Hotels & Catering Services and the Pullman Car Company did much to add to the pleasure of the journeys by good meals and service. Train catering for large numbers taking their meals in their seats presents special difficulties, as with one of the trains to Scotland, where meals were served successfully from only two kitchen cars. The rolling stock provided for the visits also was good, in some cases of the most recent British Railways design.

All this and much else that was efficiently done, both at the places visited and at Church House, has gone far to enhance the prestige of British Railways and associated transport undertakings in the eyes of the visitors from overseas. A great effort has been made to ensure the smooth working of the Congress by many people at many levels, and not least by the Minister of Transport, Mr. Alan Lennox-Boyd, who has been assiduous in attendance at functions, demonstrated the interest of the British Government in the activities of the Congress, and done much to foster good international relations in the field of railways, whilst Sir Brian Robertson, Chairman of the British Transport Commission, has been an able and distinguished President of the Session. It is gratifying to know that the Congress already has shown itself to be, and has been, recognised as successful.

International Container Traffic

ON January 1, 1953, a uniform charging system for containers was introduced as an outcome of studies initiated by the International Union of Railways (U.I.C.) in 1950 at the same time as its revisions of the International Conventions Concerning the Carriage of Goods by Rail. On that date also a new regulation came into force for the exchange of containers, governing, among other things, the provisions for payment for the late return of containers. Committees of the Union have revised the technical standards which must be met by containers for use in international traffic and have laid down provisions relating to containers used for international perishable traffic under refrigerated conditions. A text has been approved for the standard clauses governing the framing of contracts for the use of privately-owned containers in international traffic.

Governments which are parties to the International Conventions Concerning the Carriage of Goods by Rail, referred to editorially in our March 26 issue, decided on the entry into force on January 1, 1953, of International Regulations Concerning the Transport of Containers. These regulations extend to terminal road journeys, where they are performed by the railway, and lay down the principles of the railway or user responsibility in case of deterioration, loss or damage, and where the delivery period of a privately-owned container has been exceeded. Customs problems raised by transport in containers were more particularly examined within the framework of the Economic Commission for Europe at Geneva as a result of a resolution adopted by the Inland Transport Committee in 1951. In October last the European Conference of Ministers of Transport, meeting in Brussels, expressed the desire that a general agreement be drafted to cover the complete use of containers by all forms of transport.

The development of traffic in containers has been much

encouraged by the International Container Bureau, founded in 1933. A census which it carried out in 1949 showed the number of containers then existing in 18 European countries to be 77,000; this figure had risen to some 126,000 at the end of 1952, with the most noticeable increase on the railways of France, Germany, Sweden, and Switzerland.

A particularly interesting achievement in rail-sea containers has been made in Germany where, on the initiative of the Contrans Company, the rolling stock department of the German Federal Railway studied five new models of containers satisfying the requirements of the maritime authorities without detriment to their use on land. The overall height of the five types is the same, 2.1 m., they are designed to permit stacking, and they can be handled either by fork trucks or by cranes. It seems, however, that the problem of handling in holds has not yet been solved.

The railways which are members of the U.I.C. decided in 1953 to develop, in collaboration with the International Container Bureau and interested road and water transport carriers, types of containers, as few in number as possible, which could be used both on land and water. Such standardisation would facilitate mass production, with consequent lowering of constructional costs, and reduce the number of empty journeys. The U.I.C. is attempting to fix the dimensions of the types to be adopted and establish the essential conditions to be met by containers capable of being conveyed by rail, sea and road. No restrictions will be imposed on the construction of other models which should be approved individually.

Scottish Region Summer Timetables

A PART from the improvements in the running of certain trains between London and both Edinburgh and Glasgow, the summer train service in the Scottish Region is almost identical with that of 1953. There is one important change, however, connected with the acceleration of the non-stop "Elizabethan" to a 6½-hr. run over the 392.9 miles between Kings Cross and Edinburgh. Last year, with a London departure at 9.35 a.m., this express was due in Edinburgh Waverley at 4.20 p.m., and through passengers for the Aberdeen line had to wait until 5.5 p.m. before continuing their journey. This year, with a London departure at 9.30 a.m. and an Edinburgh arrival at 4 p.m., the train carrying the through Kings Cross-Aberdeen coaches leaves Waverley at 4.15 p.m., and calling at principal stations, reaches Dundee at 5.55 p.m. and Aberdeen at 7.54 p.m., accelerations of 44 and 39 min. respectively from London. The existing 4.15 p.m. from Edinburgh to Aberdeen starts at 4.20 p.m., and runs as far as Arbroath only.

This year the "Elizabethan" runs from Mondays to Fridays each week, and from June 29 to September 10 only; on Saturdays from July 3 to September 11 inclusive a train leaves Edinburgh Waverley for London at the same time (9.45 a.m.), calls at Newcastle only and is due in Kings Cross at 4.52 p.m. During the same period the down "Elizabethan" runs from Mondays to Fridays only; on Saturdays the 9.30 a.m. from Kings Cross calls also at Newcastle, and reaches Edinburgh at 4.33 p.m.; its through Aberdeen coaches are transferred at Waverley to a Saturdays only 5.5 p.m. to Aberdeen, calling at principal stations and reaching Dundee at 6.42 p.m. and Aberdeen at 8.36 a.m.

On the West Coast Route a through service is being restored this summer between Glasgow and Plymouth, twice daily in each direction. In the morning the through coaches will be attached as far as Crewe to the 10.15 a.m. London express from Central, and will reach Plymouth, via Shrewsbury, Hereford, the Severn Tunnel and Bristol, at 12.45 a.m. the following morning; in the evening they will run on the 5.30 p.m. from St. Enoch, via Kilmarnock, and will arrive at Plymouth at 10.45 a.m. the next day, continuing to Penzance and reaching there at 1.40 p.m. In the reverse direction corresponding service will be provided from Plymouth at 8 a.m., joining the "Midday

Scot" at Crewe and reaching Glasgow Central at 9.35 p.m.; and also at noon from Penzance and 3.45 p.m. from Plymouth, reaching Glasgow Central at 7.28 a.m. As to other changes, acceleration of the down "Royal Scot" brings the train into Glasgow Central at 5.15 p.m., as compared with 5.30 p.m. last summer and 6.10 p.m. during the winter months. The 10.30 p.m. sleeping car express from Glasgow Central to Euston via Kilmarnock is altered to leave at 10.25 p.m.

On the former Great North of Scotland line, the 8.8 a.m. breakfast car train from Aberdeen to Inverness is altered to leave at 7.50 a.m., and is provided with a new direct connection to Inverness, with through coaches, taking the Mulben route from Keith to Elgin. Elgin is reached at 9.58 a.m. and Inverness at 11.6 a.m., an acceleration of 29 and 31 min. respectively. The restaurant car section follows the coast route via Buckie, and reaches Inverness at 11.53 a.m., returning the same way on the 12.45 p.m. from Aberdeen.

Mechanisation of Permanent Way

THE main purpose of mechanisation of permanent way, beneficial as it is in other ways, is to enable the railway industry to render essential service with the least possible waste of manpower and materials. This is pointed out by Mr. A. Dean, Civil Engineer of the North Eastern Region, in his recent paper, for which he chose the title "Mechanisation of Permanent Way: Where is it Leading?" to the North Eastern Region Federation of Lecture & Debating Societies. In the U.S.A., he states, the civil engineers on the larger railways are now using some £350,000 worth of mechanical equipment for the equivalent of every 1,000 miles of single-line railway. The corresponding figure on the North Eastern Region is only £35,000.

Theoretically, it should be possible to do over 100 times the amount of work by mechanical means for the same cost as it is done manually. Practically, this is impossible on British Railways, where no suitable machines have yet been devised for doing much essential work in the conditions obtaining. Much costly transport and men's time, moreover, are necessary to get the machines to the work sites, and when the larger ones get there, they are prevented from working for a substantial proportion of each week because track-occupation cannot be given; high operating availability is thus seriously curtailed.

It is rarely possible for "off-track" machines to move under their own power on the cess or on railway land beside the tracks, and narrow cuttings and embankments in this country limit drastically their use from outside the track, clear of passing trains. Seldom also is there a public highway parallel to the railway from which there is frequent access to the track. There is, therefore, an over-riding limitation to the use of "off-track" machines in the United Kingdom at present, and as the cost of a service roadway beside the line would be prohibitive, the engineers are driven to the use of "on-track" machines despite the limitations imposed by British traffic density. Even where it might seem feasible to resort to single-line working on a double-line section, serious traffic delays are generally unavoidable and detrimental to competition with other forms of transport. Delays to goods trains when such single-line working is in force are particularly protracted, because they have to reverse to cross to the "wrong line."

To allow of the most economical use of mechanical equipment, Mr. Dean classifies British lines in three categories: (1) lines with intensive traffic moving at high speeds, where no weekday occupation, day or night, can be obtained; (2) medium-traffic lines where adequate occupation can be obtained on weekdays or weeknights; and (3) light-traffic lines where machines can be transported freely from place to place by rail or road. On open running lines in the first category, routine maintenance is likely to remain manual, but major repair and renewal works must be as fully mechanised as possible—with ballast-cleaners, cranes, track-lifting and tamping machines—so as to leave the track in nearly-perfect condition. Though under present

conditions the existing system of maintenance by length gangs must continue on this class of line, the increasing use of heavy flat-bottom track is continually reducing routine inspection and maintenance, so that only experience can determine future organisation.

In concentrated yard areas on lines in this first category "on-track" mechanical plant cannot be used, and repair work of any kind is most difficult on weekdays, due to the frequency of traffic movements. In the busier yards, however, the installation of either pneumatic or electric power lines, into which leads can be plugged, may solve the problem. In such cases, the portable single-unit tamping machine alone can effectively pack many of the crossing timbers. Loss of effective maintenance time is much greater at busy junctions than on even the densest-traffic open tracks, and, apart from maintenance of bolts and other fittings, the bulk of the work is likely to be confined to Sundays in future.

On medium-traffic lines in the second category which are of sufficient mileage to make it economical, there are likely to be minimum-strength length gangs, the bulk of the maintenance being carried out by fully-mechanised gangs. The possibility of increasing the number of such lines should, Mr. Dean considers, be the subject of wide-spread detailed inter-departmental investigation, wherein train-timings might be modified to permit of greater use of "on-track" machines without seriously affecting either commercial requirements or economical operating programming. It might, for instance, be possible to reduce existing light mid-morning and mid-afternoon services on at least one track by revising single-line working rules to permit of much longer wrong-line working or even by diverting some passenger traffic to a bus service.

In countries where signalling provides for working in either direction over double or multiple lines, facilities for extensive track occupation by the engineers are greater without prejudicing normal operation. Maintenance gangs can economically be transported by road vehicles or motor gang trolleys. At any rate, on this type of line train-timing research should, in his view, be carried out, taking into account the new factor of economical engineering maintenance. Without facilities for the regular occupation of the line being insured, it may be difficult to justify the purchase of many more costly maintenance machines. He also considers that on these light-to-medium traffic lines, where rail-life is long, long welded rails may be justified by subsequent reduced maintenance costs; concrete sleepers may also prove economical if prices are reasonable.

On light-traffic lines in the third category accessible for the distribution of mechanical equipment, expensive high-powered "on-track" machines probably could not be justified except for renewal works. These lines are largely single-track and, though traffic may be light, periods of occupation for such machines may well be limited. The solution suggested is medium-size gangs with relatively light machines and tools, and road and motor-trolley transport. The work of such gangs can be pre-planned, and on certain sections of the North Eastern Region is not only proving economical, but is also producing improved maintenance. Much of the equipment can be carried or wheeled on rubber tyres along the cess. Mr. Dean recommends medium weight mechanical units, with some of their weight carried on a wheel running on the cess-rail, but most of it on a pneumatic-tyre wheel on the cess, so that the whole unit can quickly be swung clear of the track.

For busy yard areas, the organisation that now appears to be developing has small local gangs for point oiling and other daily routine maintenance, but equipped with portable power-tools for maintaining the extensive siding area. Where space permits, additional engineers' sidings are recommended, being invaluable as spares, so that complete occupation of sidings one after another for repair work can be obtained on weekdays free from interruption.

On the subject of track renewals the most economical method of carrying out plain line renewal generally is to undertake the longest length that can be done as a continuous operation, with the maximum use of mechanical

equipment. To illustrate this, Mr. Dean quotes an example on the quadruple main line north of York. Occupation was obtained of the two inner or "fast" roads from Saturday night to Tuesday evening to enable $2\frac{1}{2}$ miles of the down fast road to be relaid, but it was also possible to work on that road until the Thursday afternoon; the work was mechanised to the highest degree. The "down" line was reopened for 40-m.p.h. speeds on Thursday afternoon, and the speed restriction was lifted entirely on the following Monday morning. Despite a heavy input of ballast, the cost of labour on this work was about £1,200 a mile, whereas the corresponding average cost throughout the region for mechanised renewals at that time was £1,479, and £1,727 a mile for manual renewals with normal track-occupation facilities.

New South Wales Government Railways

WE have received from Mr. R. Winsor, Commissioner of Railways in New South Wales, a copy of his report for the year ended June 30, 1953. It was another year of record earnings, the total figure, £72,675,775, exceeding the record established in the previous year by £3,776,055. An increase in charges during eight months of the year was partly responsible for the higher earnings, but on the other hand those for the second half of the year were reduced by about £3,000,000 because the Railway Department's electricity undertakings were transferred to the Electricity Commission of the State on January 1, 1953. An economic recession also adversely affected earnings, the falling off in those for coal and coke alone amounting to some £1,600,000. Special low rates and rebates and interruptions due to floods also reduced the total. An intense press and radio publicity campaign undoubtedly was responsible for improved freight and passenger traffics, as also were faster services, the extended use of containers, special one-day tours on Sundays, and the advantages of air-conditioned travel. The contribution of the Government towards losses on working developmental lines was once more £800,000.

Working expenses after deducting amounts written off for retirement of assets totalled £66,053,614, a figure only £2,468,807 higher than that in the previous year, despite increases in expenditure due to higher awards and basic wage rates (£4,612,000), increased costs of materials (£1,873,000), and superannuation, retiring leave and payroll tax (£426,000) totalling nearly £7,000,000. The comparatively small increase was due partly to the transfer of the electricity undertakings, but mostly to an intensive economy campaign during the last nine months of the year. This included reductions in staff restrictions in the use of materials and the avoidance of all possible overtime, Sunday time, and shift work.

Interest charged on loan capital, cost of exchange on interest remitted overseas and loan management expenses, and exchange on remittances together amounted to £6,960,000, £204,000 more than in 1951-52. After providing for working expenses and all statutory charges on loan capital the result of the year's working was a deficit of £1,449,839. Shortage of available loan money caused the Railway Department to suspend work on new suburban lines, and the quadrupling of two sections of main line, and to retard contracts with suppliers of rolling stock and materials.

Some of the principal figures for 1951-52 and 1952-53 are given below:—

	1951-52	1952-53
Total miles open for traffic	6,112½	6,112½
Earnings	£68,909,720	£72,675,775
Working expenses	£64,020,193	£66,451,995
Balance	£4,889,527	£6,223,780
Percentage of profit to capital invested	£2 7s. 5d.	£2 17s. 9d.
working expenses to earnings	92.90	91.44
Earnings per average mile open	£11,273	£11,889
Working expenses per mile open	£10,473	£10,871
Return per average mile open	£800	£1,018
Passenger journeys	268,167,596	271,698,493
Goods tonnage	18,527,732	17,876,515

During the three periods July-September, 1952, February-March, 1953, and May, 1953, normal train services were interrupted in various parts of the State by heavy rain and floods. In December, 1952, a new air-conditioned train was placed in service between Sydney and Grafton as the "North East Coast Daylight Express." It consisted of five saloon-type cars, a buffet-dining car, and a power brakevan, providing accommodation for 74 first- and 155 second-class passengers; it gave a tri-weekly service in each direction. Successful one-day Sunday train tours were inaugurated in February, 1953, from Sydney, the distances covered varying from 140 to 400 miles, usually with connecting motor tours of about 20 miles to beauty spots. For the longer runs, such as to Canberra, air-conditioned trains were worked by diesel locomotives.

During the year under review 24 of the 50 powerful Garratt locomotives ordered from Beyer Peacock & Co. Ltd. were received, assembled, and placed in service. So also were 20 Baldwin locomotives, supplied through an Australian firm. Sixty-two passenger vehicles were

also placed in traffic, and 7,370 wagon underframes, 296 goods brakevans, 516 hopper wagons, 97 refrigerator vans, and 293 bogie louver vans were also to hand. The Baldwin locomotives are of the 2-8-2 type and are fitted for oil-burning; like the Garratts their axle-load of 16 tons gives them a wide range of usefulness. The 20 Alco diesel-electric locomotives in service worked mainly as multiple-units of two, and ran practically 2,000,000 miles, hauling over 925 million ton-miles with an average consumption of 0.0022 gallons per total ton-mile, during the year.

No large-scale construction work was completed though until October, 1952, work was in hand on the various Sydney suburban lines, doublings and quadruplings. On August 23, 1952, Mr. K. A. Fraser, Commissioner of Railways, died, and was succeeded by Mr. R. Winsor as from September 1. On January 1, 1953, Mr. N. C. Vogan was appointed Chief Civil Engineer in succession to Mr. R. V. G. Pennefather, retired. On February 1, 1953, Mr. F. W. Cazneau was appointed Comptroller of Accounts & Audit, on the retirement of Mr. F. V. Bullen.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Exchange of Railway Posters

May 20

SIR,—Mr. Rodges's kind remarks about our new lightweight diesel trains and the "Popular Carriage" Exhibition at Euston in *The Railway Gazette* of May 14 are greatly appreciated. With regard to his suggestion that posters should be exchanged between European railways, such a scheme was in operation for many years before the war and was revived soon after hostilities ceased. Mr. Rodges will, I am sure, be interested to know that British Railways posters may be seen on railway stations in nearly all European countries from Norway to Italy and from Luxembourg to Portugal.

Yours faithfully,

J. H. BRENNER

Chief Public Relations & Publicity Officer

British Transport Commission, 222, Marylebone Road, London, N.W.1

Motive Power Maintenance Figures

May 11

SIR,—With reference to Mr. J. B. Latham's letter in your May 7 issue, the Association of American Railroads statement of the locomotive position on January 1 was reproduced on page 229 of *The Railway Gazette* of February 26. By April 1 the numbers of the three types of locomotives under repair changed as follows:—

Type	Number under repair	Percentage of stock
Steam	1,222	11.2
Electric	79	13.0
Diesel-electric	596	3.5

Evidently the railways have been overhauling their motive power during the slump in traffic which has reduced freight train mileage by 10 per cent or more. Their policy is to pay great attention to the fitness of their expensive diesels. The lead given by the Pennsylvania, with unique experience of the three types, is explained below.

In the six years 1948-53, the Pennsylvania dispensed with 2,700 steam engines, reconditioned all electrics by heavy repairs, and invested some \$300 million dollars in diesels. At the end of 1953 it owned 1,391 steam, 272 electric, and 1,404 diesel locomotives. The steam engines are used to give an economical flexibility of working; when traffic falls off, only steam engines are idle, so as to avoid the loss of the diesels' earning power. During the last six years, the Pennsylvania spent \$21,000,000 on new diesel shops and new machinery for existing locomotive shops. At the fine

Harrisburg shop, 172 diesel units are serviced on a production-line maintenance system, which allows many employees to specialise in one particular job.

Mr. Latham asks about the Norfolk & Western's experience with steam locomotives. In 1953, the under-repair percentage of its 272 freight road locomotives was 7.3. These locomotives haul trains of 2,110 short tons at nearly 18 m.p.h., and run 87 miles a day on an average. Of 129 yard shunting engines, four were under repair.

Yours faithfully,

YOUR CORRESPONDENT

Westminster, S.W.1

Diesel and Electric Multiple-Unit Stock

May 22

SIR,—According to his letter in your issue of May 21, Mr. W. J. Williams does not appear to have considered the difficulty of fitting bus engines and transmission assemblies on British Railways standard carriages. I agree entirely with him that one large engine would be preferable, presumably body-mounted with electric transmission. A unit of this type could be built largely from standard carriage components. Undoubtedly four engines must require more maintaining than one and in this connection I noticed that there was no reference in the article on the new lightweight diesel trains in your May 7 issue to any facilities for maintaining the units to be operated in the North. Obviously it would be ridiculous to attempt to run these railcars without specially trained staff using suitable equipment for servicing them.

Mr. Williams rightly criticises the standard two-car electric units for being too standardised, though he seems to have an axe to grind with the Southern Region. However, I hope he does not favour chassisless, light-alloy electric stock for express services! The main defects of the standard electric stock are in the bogie design and the brake gear. These coaches could be greatly improved by fitting them with motor bogies with only one axle motored, with trailer bogies designed for electric stock from the outset, and with bogie-mounted brake cylinders eliminating the foundation rigging.

Yours faithfully,

T. HARRIS

72, Richmond Road, West Wimbledon, S.W.20

[As stated in our May 7 issue, the new diesel trains will be based on certain stations equipped for their maintenance; editorial reference to servicing of the trains to work in West Cumberland is made elsewhere in this issue. Measures have been taken to ensure availability of trained maintenance staff where necessary.—Ed., R.G.]

THE SCRAP HEAP

A Fitting Occasion

After his mates had made a canvas sign, reading "Engineer R. J. Bunt, final run," for his retiring trip as driver of the Toronto-London express, at the last minute the sign was found too wide for Driver Bunt's usual "6400" class engine.

So the Canadian National Railways changed the engine for a "Mountain" class locomotive big enough to take the sign.—From the "News Chronicle."

Railways and the English Landscape

The railways had begun to manipulate the landscape on a grand scale from the first. They took over from two generations of canal builders: they inherited the civil engineers, the planners, the architects, and the navies, the inland navigators. Once they started, they manipulated the landscape grandly. Nothing like the earthworks of the railways had been seen in this country for a long time. To find anything comparable you have to go back to the early iron age. . . . Yet we hardly notice the earthworks which the railways planted on the surface of England: partly because we take them all for granted, but partly also because it is difficult to see them. One can pass over the Wharfedale Viaduct, near Hanwell, on the G.W.R. from Paddington, and never know that one is passing over one of the triumphs of Brunel's engineering. We run over Brunel's beautiful bridge at Maidenhead and do not see it. We run over

the viaduct at Chippenham—we may notice that—and later we go into the classical Renaissance portal of the Box Tunnel, and unless we happen to know that it is worth looking for we are very unlikely to see what a beautiful entrance it is.

The magnitude of the impact of railways on the country landscape was enhanced by the views of the engineers about gradients. Brunel, who engineered the G.W.R. from London to Bristol, would have nothing steeper than 1 in 660 for the first 85 miles out of Paddington; Robert Stephenson, who engineered the London & Birmingham Railway, would have nothing steeper than 1 in 330 except the first rise from Euston to Camden, which he got over in other ways; and Locke, on his London & Southampton Railway, moved 16,000,000 cubic feet of earth in cuttings and embankments, especially between Basingstoke and Winchester, where there are some of the best examples of railway cuttings in the world.—From a B.B.C. broadcast by W. G. Hoskins.

Moderate Restaurant Car Prices

The menu card in the accompanying illustration, from the restaurant car of the Union Pacific "Challenger" streamliner has been sent to us by a correspondent, and shows the moderate charges for a table d'hôte meal and à la carte. Mr. A. E. Stoddard, President of the Union Pacific Railroad, points out that while the deficits on the restaurant ser-

vice cause some concern, the low-price meals in the "Challenger" service are very popular.



The Challenger Streamliner

FAMILY DINNER - \$1.00		
Baked Chicken Pie, Family Style		
Mashed Potatoes	Green Peas, au Beurre	
Rolls and Butter		
French Shortcake	OR	Pumpkin Sundae
Coffee	Tea	Milk
A LA CARTE		
Veal & Soup, Cup 15		
Cold Sandwiches 45	Cold Salmon Plate 45	
Fruit Salad 15	Combination Salad 45	
Ham Sandwich 50	Beef Sandwich 50	
Chicken Sandwich 60	Chicken Sandwich 40	
Hamburger Sandwich 30		
French Fried Potatoes 30		
Bread or Rolls 15		
Freshly Baked Pie 25	Pudding 20	
Fruit Gelatine 20	Ice Cream 20	
Sandwich 50	Canned Fruit 25	
Cheese with Crackers 25		
Coffee (Pot) 20	Tea (Pot) 20	Cocoa (Pot) 20
Milk (Ind.) 15		
Prices shown subject to sales tax in states where applicable		

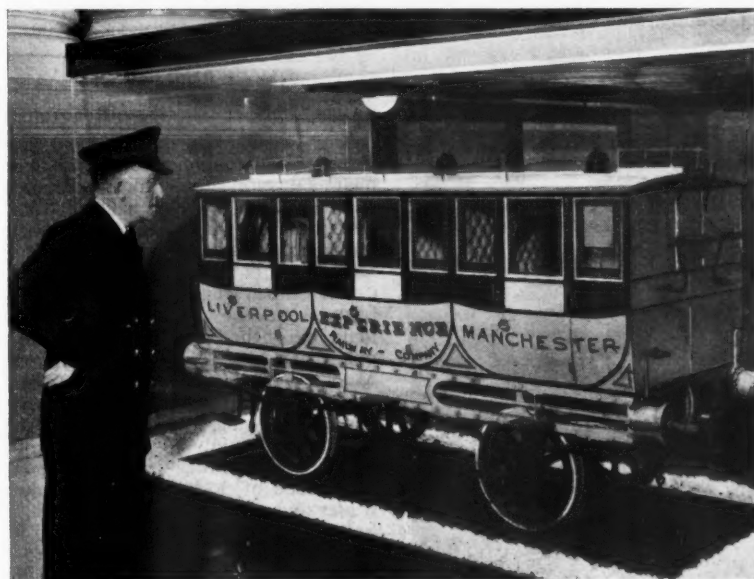
Restaurant car menu in The Union Pacific "Challenger" streamliner, showing the moderate prices charged

The "Challenger" runs between Chicago and Los Angeles. The top portion of the menu shown can be detached as a colour picture postcard; on the back is given further information on restaurant car facilities and prices, with brief reference to the subject of the picture. In this case it is Bryce Canyon, National Park, Utah, near the route of the "Challenger"; a similar menu depicts the Hoover Dam, Nevada. Menus from the "City of Los Angeles" (Chicago-Los Angeles) also sent us by our correspondent, have attractive colour covers; in these trains also the prices are moderate.

Umbrellas in the Firebox

One of the oldest ex-engine drivers in the country, Mr. T. C. Foreman of Boxmoor, recently gave some of his reminiscences to the London Midland Region edition of *British Railways Magazine*. Mr. Foreman, who is now 92, joined the Somerset & Dorset Joint Railway at Bath in 1876 as a bar lad. He recalls that one of his duties was to climb inside locomotive fire-boxes to re-lay the fire bars and to clean the tube ends. In some of them the crown stays of the box leaked so badly that Mr. Foreman took with him an old umbrella with a shortened handle. He held the umbrella above his head while he worked to protect himself from the drips of scalding water.

B.T.C. "Popular Carriage" Exhibition



A model of a first class coach of about 1834 on the Liverpool & Manchester Railway, one of the exhibits at the "Popular Carriage" Exhibition now open in the Shareholders' Meeting Room at Euston

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

NEW ZEALAND

Rimutaka Tunnelling Equipment

Equipment used in driving the Rimutaka Tunnel is to be used to drive a six-mile tunnel to take water from Lake Rotorua, south of Nelson, to Tutaki Valley for the Braeburn hydro-electric scheme. Most of the equipment used on the Rimutaka Tunnel belongs to the New Zealand Ministry of Works and was specially designed for its purpose.

CHINA

Expansion of Railways

According to a recent report lines built in China during the past four years total some 913 route-miles, and an additional 373 route-miles is under construction. The total length of the Chinese National Railways is stated to be 15,050, though other sources of information give it at less than 8,000.

SOUTH AFRICA

First Class Passenger Traffic

The number of first class passengers carried annually by the South African Railways has shown very little variation over a period of five years. The total journeys (first class) made during 1949 on main line trains numbered 1,469,809. Three years later, 1952, the number was 1,500,288, and statistics now available show that the number in 1953 was 1,476,042.

Railway Bus and Coach Services

The measure of public support for S.A.R. & H. road services has in recent months been on the upgrade. Returns

up to the end of January this year show that passengers during the period April 1, 1953, to January 31, 1954, advanced by 391,884, the goods tonnage carried increased by 284,372 and livestock by 33,071 head. Revenue during this period advanced by £517,627 and expenditure by £268,795 but the net loss of £342,420 was an improvement of £268,795 on the corresponding period of the previous financial year when the loss was £517,627.

IRAQ

Proposed Trans-Arabian Railway

The Iraqi Government has accepted an invitation from the Arab League to an economic conference. Transport questions on the agenda include the proposal submitted by Syria in 1945 to build a railway connecting Baghdad with Damascus or Amman. The line would be 530 miles long (to Damascus) or 30 miles longer to Amman.

CANADA

Instruction in Freight Handling

The Canadian National Railways are embarking on a twofold campaign to educate railway staff and shippers in improved methods of handling and loading freight traffic.

A "picture window" box car, the first of its kind in Canada, has been designed and constructed in the C.N.R. shops at Montreal. One entire side of a box car has been fitted with Plexiglass, so that freight handlers, train, and yard crews, will be able to see inside and observe the contrasting effects of proper and improper loading, coupling, packaging, crating, and stowing.

The demonstration car will have a cargo of dummy consignments of mixed size and character. A 3-ft. speedometer on the car records the actual speed at which the car is coupled to other units. A smaller indicator shows the mileage and running speed that the car is moved. A recorder in the car registers the impact of switching and coupling operations.

The Plexiglass panels are set in rubber to absorb their expansion under heat and to cushion them. An inner metal screening will prevent contact of the car's lading with the Plexiglass.

Besides the new car, the C.N.R. programme to promote safe and careful freight handling practices includes lectures, films, posters, circulars, and pamphlets. At principal points across the system, the company has established offices staffed with staff experienced in all phases of packaging and loading requirements to help business and industrial undertakings with their particular shipping problems.

New C.N.R. Lines

A Bill has been introduced in the House of Commons to authorise the Government to guarantee up to \$44,562,500 in Canadian National Railways bonds for building two branch lines to open up mineral and timber wealth in Northern Quebec and Ontario.

The Minister of Transport, Mr. Lionel Chevrier, said that the largest branch line, 294 miles long, would be built into the Chibougamau mining area of Quebec at an estimated cost of \$35,000,000, and that the other line, 27 miles long, would run into the Manitowadge Lake mining district in Northern Ontario, at a cost of \$3,750,000.

SWITZERLAND

Aigle-Champéry Railway Renovated

The renovation of the track and electric overhead equipment of the 15½-mile metre-gauge electric railway between Aigle and Champéry, in hand for some months, is now completed. Three new motor coaches have been placed in service.

The railway consists of two sections, from Aigle (on the Lausanne-Brigue main line of the Federal Railways, a few miles south of Montreux) via Ollon to Monthey, 7½ miles, opened in 1907, and that from Monthey to Champéry, partly rack, 8 miles, opened in 1908. The line serves mainly for tourist traffic in the Val d'Illeiez, Champéry, at an altitude of 3,200 ft., a well-known winter and summer tourist centre.

The Gornergrat Railway in 1953

The Gornergrat Railway, the southernmost section, nearly 5 miles long, and rack throughout, of the Brigue-Visp-Zermatt railway, carried 318,800 passengers in 1953, thereby exceeding

Former Indian Locomotive in East Africa



A 4-6-0 wood-burning locomotive, built by the Bombay, Baroda & Central India Railway in 1926, shunting at Mwanza on the Tanganyika Central Line of the East African Railways

the record of 256,700 passengers attained in 1952. The working surplus amounted to Fr. 637,395.

The Gornergrat Railway Company has in hand a scheme for the building of an extension in the form of a ropeway between Gornergrat Station and the summit of the Stockhorn. The ropeway will have two sections, between Gornergrat and Hohtäli, 4,392 ft., long, to be placed in service in the summer of 1955, and from there to the Stockhorn summit, 5,033 ft. long, to be opened by the summer of 1956. This new tourist attraction is expected to contribute towards the further development of tourist traffic on both the Brigue-Zermatt and Zermatt-Gornergrat Railways.

FRANCE

Battery Maintenance

It is necessary from time to time to re-plate the batteries in use for lighting on passenger coaches. When the batteries are assembled an outer protective metal cover is provided consisting of a series of metal plates joined together at the edges by welding. Before the battery plates can be taken out the metal

cover at the terminal end must be removed, and until recently this was cut away by a grinding wheel whilst the battery was held in the hand. This made it difficult to ensure accuracy.

At Bordeaux-Saint-Jean workshop a grinding machine has been specially adapted for this purpose; a pneumatically controlled cradle is provided to hold the battery continually in the correct position against the grinding wheel.

Covered Wagons Converted to Flat

Some old types of covered wagons had become so unserviceable that their reconstruction seemed likely to be uneconomic, but it was found that many of the undercarriages were either in, or could easily be put in, good condition. The wagons were therefore adapted as flat wagons at a cost considerably less than would have been incurred in repairing them as covered wagons.

BELGIUM

Wagons-Lits Results

The net working receipts of the International Sleeping Car Company for 1953 were, at B.frs. 168,198,434, slightly

more than 20 per cent lower than those for 1952. At B.frs. 26,740,625, the net profit for 1953 was more than 40 per cent below that for 1952.

The report points to the contraction in the company's affairs in 1953, which was even more pronounced in the second half of the year. Efforts to reduce working expenditure were hampered in several countries through the necessity to grant wage increases. The position deteriorated also as the result of the strike in France last August.

The number of passengers carried in the company's sleeping cars during 1953 fell to 1,647,000 from 1,711,000 in 1952, and the number of meals served in its restaurant cars in 1953 was lower at 5,079,000 compared with 5,175,000.

AUSTRIA

Fast Connection with the Ruhr

The "Glückauf" diesel railcar express between Essen and Frankfurt/Main was extended to Vienna as from May 23; the 661 miles between these two towns is covered in slightly over 15 hr.

Publications Received

Time Counts. The Story of the Calendar. By Harold Watkins. Neville Spearman, London. 8½ in. x 5½ in. 274 pp. Price 15s.—The author is a member of the British Advisory Council of the World Calendar Association, and the Chairman of the Council, Lord Merthyr, has contributed a preface. The proposed World Calendar described has equal 91-day quarters each with one month of 31 days and two of 30 days. Every year is the same and every month has 26 week-days. Each year commences on Sunday, January 1, and each quarter begins on a Sunday and end on a Saturday. The year is ended by a 365th day following December 30. This is a world holiday, not included in the calendar, and known as "Worldsday." Leap years are adjusted by a similar day added after June 30. This should help concerns which can close down completely on the proposed Worldsdays, but railways and other public services which must operate continuously would meet the same difficulties as now in comparing one quarter's statistics with another.

How to Travel by Train.—The Public Relations Department of the American Car & Foundry Company has issued, with the assistance of all the major passenger-carrying railways in the U.S.A., a booklet designed to present in compact form all the information likely to be needed by rail travellers in that country. It sets out to show how easy, convenient, and pleasant rail travel can be and is directed specially to those who have normally travelled by car or by

air. Among the subjects dealt with are the planning of trips, sleeping and meals in trains, how to deal with baggage, tipping, ticket availability, and the making of reservations.

"English Electric" Traction.—This 36-page brochure issued by the English Electric Co. Ltd. illustrates a large number of electric and diesel-electric trains and locomotives which the company has supplied to countries throughout the world. A map showing the widespread distribution is a feature of the brochure. Each illustration is supplemented by descriptive paragraphs and a table of principal dimensions and data. There is a list of orders received recently over and above those illustrated and the extent of the firm's operations in this field is underlined by a comment in the foreword that traction equipment totalling over 1,000,000 h.p. has either been ordered from or supplied by this company since the war.

One and All.—Features in this quarterly publication by Tangyes Limited, of Cornwall Works, Smethwick, include an article by Mr. C. G. Tangye, Assistant Managing Director, on the activities of the British Cast Iron Research Association Centre, Bordesley Hall, Birmingham, with whose activities the firm is associated. A summary is given of a paper delivered to the Oxford University Engineering Society, by Mr. J. Gamble, Chief Designer, diesel oil engines. Details are supplied of several of the firm's products, including the hydraulically-operated 25-ton Universal testing machine, for all types of tensile, compression, beam, shear, and bending

tests; this machine can also be used for many precision pressing operations such as bushing, forming, and straightening.

Hoffmann Roller Bearings.—With the object of giving users and prospective users of Hoffmann roller bearings, an insight into the problems connected with the production of this type of equipment, and the methods by which extreme accuracy are obtained, are given in a booklet recently issued by the Hoffmann Manufacturing Co., Ltd. All aspects of manufacture are dealt with from the design stage, through the various processes from the receipt of raw material, to the finished product. The story is told concisely and is illustrated by a series of free style sketches.

Importance of Steel Scrap.—The collection of steel scrap is still of the utmost importance to the steel industry of this country, and much has been achieved in this respect both in the many branches of industry and also by the general public. A booklet "The Immortality of Steel," issued by the British Iron & Steel Federation, provides an interesting review of what has been accomplished. It records the circumstances in which the steel scrap survey and drive was launched and the methods adopted, and it attempts an assessment of the results so far achieved. While the steel shortage in the Spring of 1951 has been overcome as a result of the intensive steel scrap campaign then initiated, it remains a matter of vital importance to ensure the continuous effective collection of steel scrap, which will otherwise be lost to the national economy.

*Sixteenth International Railway Congress***Radio-Telephony or Telegraphy in Railway Operation***Point-to-point services; marshalling yards; communication between dispatcher and train; controlling engineering operations; emergency working; television*

THE reporters on Question 5 for the United Kingdom, Republic of Ireland, the British Commonwealth generally and countries for whose international relations the United Kingdom is responsible, also Scandinavia, Finland, Indonesia, Iran and Iraq, were Mr. S. G. Hearn, Operating Superintendent, London Midland Region, British Railways, and Mr. J. H. Fraser, Chief Officer, Engineering (Signal & Telecommunications), British Transport Commission. Their report is very extensive and detailed and only a brief general review of it can be given here.

In 1922 the British railways approached the Postmaster General for permission to use wireless, but this was refused and up to the second world war, although important experiments had been undertaken, little use seems to have been made by railways anywhere of such communication; during that war little progress was possible. Great technical advances were, of course, made under the impetus of the needs of the day. The report explains the phenomena of radio-wave transmission, concluding that there is little hope of railways being allotted channels in the lower frequency bands and that their future lies in the use of V.H.F., possibly even microwave radio, which suffer less from mutual interference and enable the same frequencies to be employed simultaneously in different localities. The margin of railway frequencies now falls into two categories (a) the V.H.F. band, 70 to 80 Mc/s. and 150/180, and (b) the higher end of the M.F. band and lower end of the H.F., on 1.5 to about 15 Mc/s. Both are used for mobile services and point-to-point communications but the former is employed mainly for the mobile type. In several countries considerable use is made of wireless between fixed stations over extensive areas, although primarily for telegraphic signals.

Installation on Burma Railways

Before the last war the Burma Railways communications were worked over line wires, but these were damaged considerably, or were even non-existent in certain areas after hostilities. It was necessary therefore to resort to radio methods. Civil disturbance also necessitates a system not subject to sabotage. Radio equipment accordingly was installed where it was thought the greatest benefits would be obtained.

Similar considerations applied in East Africa. Land line communication is not 100 per cent efficient, due to interruption from circumstances outside Post

Office control. In this case radio is mainly used for telegraphic messages, although telephonic ones also are exchanged, but seasonal changes caused by solar disturbances result in deep fading during the day so that spoken messages are confined to certain hours. It is thought, however, that if efficient on request services can be given by the Postal Department then radio would be kept to telegraphic work as telephonic messages can be picked up by the public on commercial receivers.

Indian Railways Network

The Indian railways have an extensive network of linked wireless stations with both telegraphy and telephony, but the latter is used only when land channels are not available or are congested. Wireless was adopted as a secondary means, being considered more reliable, cheaper and quicker on long distance circuits. The network covers railway, divisional and district headquarters and important centres. About 200 frequencies are issued to the railways of which normally only two are assigned to each channel, one for day the other for night operation. Frequencies are allotted by agreement between the Government departments concerned.

Application in Britain

In Great Britain, with its congested conditions, radio between fixed points has been discouraged by the Postmaster General. No application of it has been made but during the war, by special permission of the military and other authorities, a backbone of fixed stations with mobile ones at convenient centres ready for dispatch, was established, with frequencies in the medium band. Only cipher telegraphic messages were allowed although the sets could transmit speech, used solely for testing. These facilities were licensed only as an emergency stand-by and apart from that the apparatus offered no advantages. It was more expensive, slower and less reliable than the existing wired circuits.

The greatest extension and variety of radio applied to railway work is seen in the U.S.A. Frequencies allotted for land mobile services may not be used for point-to-point communication except between adjacent base stations, provided interference is not caused to equipment on rolling stock. This wireless has been used in emergencies, such as snow storms, floods, fires, etc. Located along the line it is less likely to be damaged by emergency conditions. This is particularly the case with base stations equipped with auxiliary power. Great advances have been made in

America of late years in applying radio to specific phases of train operation. Communication between the head and tail of a train is widely used. Trains are often as much as $1\frac{1}{2}$ miles long—even more—so that communication between members of the crews is essential to co-ordinate the running; visual communication is inadequate. Intercommunication between one train and another also is carried out in America; also between trains and road vehicles.

In Malaya radio is used between the driver of a pilot and the crew of the mail train following. If the former must stop risk of collision is minimised. Communication between fixed points and trains can supplement the ordinary means at the disposal of the dispatcher.

Radio in Marshalling Yards

Radio has found considerable scope in marshalling yards, especially in the U.S.A., where there are many large yards now being extensively remodelled. Almost every conceivable link needed in a yard has been provided by radio. A great variety of apparatus exists, including "walkie-talkie" sets used between staff out in the yard and the controlling staff. There are some installations in Sweden and Finland and one in Britain for regular use between control tower, hump foreman's cabin and the shunting engines. Differences of yard organisation compared with American practice make any great extension of such methods unlikely, as generally the expenditure cannot be justified.

Radio is found also to have certain uses in connection with engineering operations. In East Africa, for example, it was found very valuable when relaying a 113-mile section, enabling the resident engineer to have immediate contact with his section engineers. Such arrangements can be carried out over very rough ground where no ordinary communications exist.

Wireless in Engineering Operations

In Britain the London Transport Executive uses wireless for engineering operations; one system is for civil engineering work and communicates with eight road vehicles, covering the entire Executive's railway area. The second set is used by the Signal Engineer. These arrangements were adopted to enable constant contact to be maintained with key personnel needing to be spoken to immediately and instruct mobile gangs from a central point. A similar service has been introduced by New South Wales, with communication between several base stations and a

number of road vehicles. This has enabled high tension traction faults to be quickly rectified. Normal maintenance staffs can be summoned readily in emergencies when every man is needed. It is contemplated to extend this to the signal and communications maintenance service. Wireless has been found very useful in Great Britain by the signal engineer in positioning, adjusting and testing of isolated colour-light signals and co-ordinating staff when bringing major schemes into service.

Other Uses

Trials have been made in several countries with apparatus for ancillary services such as communicating with railway owned tug boats, controlling crowd movements at holiday times, or the working of cartage vans, using radio equipped vehicles manned by inspectors. Police staffs also are using wireless increasingly. The New South Wales Government Railways have an important service dealing with the prevention and detection of thefts from railway vehicles and premises.

From time to time the question of public wireless communication with trains for passengers' use is discussed. A few lines in America have such facilities which operate through the radio stations set up by the telephone companies which provide the public services in that country. The demand for the service is limited and generally means loss to the railway.

Radar

There are obvious difficulties in applying radar to railways where there is not the unobstructed space around the train that applies with a ship or an aeroplane. It would be difficult to avoid interference from transmitters on trains on adjoining lines and the system might be inherently unsafe, as failure to transmit or receive a signal might indicate a clear track. The problem of isolated vehicles left on the line is not easy to deal with, even if "secondary radar" is used. A form of radar has been applied in marshalling yards in the U.S.A. to determine the speed of trains and vehicles and enable the retarders to be regulated correctly.

Television

A few applications of television have been made in the U.S.A., as in the marshalling yard installation described in our issue of November 13, 1953. The limitations are that the camera cannot reflect anything not clearly visible to it; it requires a constant source of light and while this is possible for specific tasks, day or night, where atmospheric conditions are generally good it is difficult to see how the handicaps of fog and snow could be overcome.

Aerial Equipment

Various forms of aerial are in use, directive and non-directive. The shorter the wavelength the more readily can directive aerials be made and with

micro-waves concave metal mirrors can be used to get a relatively narrow beam. Reception from interfering sources is reduced by using directive equipment.

Except for point-to-point communication highly directive aerials are not needed. All-direction aerials probably would be required at most marshalling yards but at Whitemoor, in Great Britain, horizontal half-wave dipoles were used. These are bi-directional and the yard being relatively long and narrow no disadvantage was experienced. A difficult problem is to put an aerial on a locomotive cab; many designs have been made. The report illustrates one special form of quarter wave aerial formed of a tube with a disc top. Using higher frequencies and smaller aerials might help in easing the position. Normal practice in communicating with trains is to use frequencies in the V.H.F. bands, usually 80 to 160 Mc/s. but U.H.F. band experiments appear hardly justified. With walkie-talkie sets the aerial may handicap the operator, say when going between vehicles. They are usually quarter-wave unipoles of flexible rod or springy ribbon. Increased frequency would of course give a smaller aerial. The portable transmitter has been produced in America to operate on 152/174 Mc/s. and complete with batteries, etc., weighs only 1 lb. 13 oz. With 20-40 milliwatt output the range is about 5 miles. The aerial is actually the carrying handle.

Types of Aerial

For point-to-point services aerials tend to be of conventional type with what are called the Windom and Rhombic also. These are described in the report. All aerials used for railway work are reasonably satisfactory and there seems no great probability of revolutionary new designs. Improvements in the direction of requiring less space are desirable for mobile work. Transmitting and receiving apparatus should be entirely reliable, robust, compact and, for locomotives, shock and dust proof. Quick replacement when faulty can best be obtained by plug-in attachments; with these local staff do not need to be highly specialised. How far fault location should be carried out on site is debatable, to be decided by each organisation depending on the type of maintenance staff available.

There is a considerable range of power outputs in the equipment used by various railways. For point-to-point service on frequencies of 1.5 to 15 Mc/s. powers up to about 1,500 W. are employed and at base V.H.F. stations for mobile services power ranges usually from 20 to 100 W. with the mobile unit using 5 to 25. Walkie-talkie output is usually between 0.1 and 1 W. On V.H.F. or high frequencies a large increase in power will result only in a small increase of range beyond sight distance and working beyond the optical horizon necessitates repeaters or relay stations, with chains of such for long distances.

Both duplex and simplex systems are

used, but which depends on the work to be performed and the licensing authorities' stipulations, while calling of mobile stations is usually effected by call signs, frequently over loudspeakers. There is some automatic selective calling using telephone dials. Reliability depends obviously on efficient power supply. Local supplies are used when reliable but stand-by plant may be considered necessary. With mobile or walkie-talkie sets weight of the power equipment is important. On steam locomotives there is often a generator, with accumulators in guards' vans charged at a depot or en route. Dry cells can be used in walkie-talkie.

Interference

Factors tending to interfere with reception are important. Fading and distortion can occur from interference in several ways. Noise from overlapping frequencies can be a nuisance and also atmospheric effects. Heavy rain and mist can "black out" certain signals. Trouble in built-up areas seems to be confined to V.H.F. band frequencies. Experience with higher ones is limited but Norway reports some limitations on distance in such areas. Denmark experienced something similar. Tunnels and cuttings adversely affect transmission but with inductive systems a wire through ensures continuity. Serious interference from solar disturbances seems to be confined to tropical areas. Outside electrical interference is not common but has been experienced from diathermy apparatus. Interference from electrical storms is possible at around 80 Mc/s. and below but increasing the figure to 160 makes it negligible. Mechanical noise interference on engines can be dealt with by special arrangements, using loudspeakers and so on.

The report concludes with discussions on micro-wave equipment, pulse modulation, and future possibilities of railway radio.

PASSENGER SAFETY AT STATIONS.—Methods of warning passengers of gaps between coaches and platforms were discussed in the Court of Appeal recently when an appeal by a passenger who broke her leg when she stepped into the gap from a double-deck coach in 1950 was dismissed. The passenger had claimed damages, alleging negligence by the British Transport Commission. Counsel for the passenger said that the double-deck coach did not have the step at the door found in ordinary coaches. He suggested that loud-speaker warnings could have been given. Lord Justice Denning said that the loud-speakers often produced an unintelligible jumble of sound, and counsel agreed with him that lights could be put below the edge of curved platforms as at Underground stations. Counsel also said that porters could shout warnings. Lord Justice Singleton suggested that the guard could warn passengers by means of loudspeakers in the coaches. Counsel for the B.T.C. said that provided the risk was not too great it was better to accept it than to have more noise in a noisy world.

Sixteenth International Railway Congress

*Meetings of the five sections:
functions, visits and excursions*

IN the evening of May 19, after the opening ceremony described in last week's issue, some 1,000 delegates and their ladies attended the reception by H.M. Government at the Tate Gallery, and many notable guests were present representing public life in this country. Guests were received by Mr. Alan Lennox-Boyd, Minister of Transport & Civil Aviation, and Lady Patricia Lennox-Boyd, who were accompanied by Sir Gilmour Jenkins and Lady Jenkins.

On May 20 the Congress proceeded to deal with the questions which had been prepared for consideration. The five sections met separately under the respective presidents. Section I (Way & Works) met with Mr. J. C. L. Train, Member of the British Transport Commission, as President. The section dealt with the summaries of the Special Report of Dr. Schramm on Question 1 (permanent way), and there was considerable discussion on the drafting of the summaries. A sub-committee was formed to consider a new draft of some items.

Section II (Locomotives & Rolling Stock) under Monsieur Goursat, of the French National Railways, as President, dealt with the five summaries of the Special Report prepared by Mr. Squilbin, on Question 4 (efficiency of steam locomotives). The section proposed a number of amendments to the summaries. Section III (Working), met in Convocation Hall, Church House, and, under its President, Pr. Dr. Ing. W. Schmitz, of the German Federal Railway, entered on a lively discussion of C.T.C. under Question 6.

Section IV (General), met under its President, Dr. Ranzetti, of the Italian State Railways. Mr. F. Lemass, of C.I.E., Special Reporter, gave a summary of his Special Report on Question No. 7 (staff recruitment). Here again there was some revision of the text of the summaries and Summary No. 6 was deleted. Section V (Light & Colonial Railways) met under the chairmanship of Monsieur Vrielynck, Belgian National Light Railways. Monsieur Ripert read the summaries of the Special Report on Question 10 (wear of rails), and many of the nine summaries were adopted as they stood. There was some change of text in other cases.

Visit to Swindon Works

Visits to Swindon Locomotive and Carriage & Wagon Works took place in the afternoon. Delegates were able to see the chief building and repair centre for locomotives on the Western Region and the well-equipped shops of the Carriage & Wagon Works. Interest was added by the supply to delegates of a small handbook giving

particulars of machines of British manufacture to be seen on the tour of both Works.

The special train, booked to cover the 77½ miles in 86 min., was 2 min. late at Slough. This was regained before Reading and at Swindon the train was 3 min. early. On the return journey, booked in 85 min., Southall was reached on time but a delay to the train ahead caused a 5 min. late arrival. The locomotive on both runs was No. 6015, *King Richard III*.

There was also a visit to the London Transport Civil Engineering Depot at Lillie Bridge, where delegates were shown the welding shop, designed to fabricate, handle, and load 300 ft. welded rails. An alternative tour by motor coach was arranged from Swindon for those not wishing to see the works and there was also an excursion to Brighton. Sightseeing tours of London were also arranged.

Permanent Commission Dinner

In the evening, Monsieur M. De Vos, President of the Permanent Commission, invited the British organisers of the Congress to a dinner held at the Dorchester Hotel. The members of the Permanent Commission were also present. Those present included Mr. Alan Lennox-Boyd, and Sir Brian Robertson, Chairman of the British Transport Commission.

On Friday, May 21, the sections resumed their deliberations in the morning and made good progress with the preparation of agreed text for the summaries. Section IV passed on to deal with Question 8 (organisation), and Monsieur Dugas, the Special Reporter, gave a summary of the main points in his report.

Southampton Docks

Technical visits that day included Southampton Docks and the Liverpool Street-Shenfield electrification, with the Central Line tube extension. On the visit to Southampton delegates were taken for a cruise on Southampton Water to show them something of the extensive shipping, railway, docks, and industrial installations of this railway-developed port. The Ocean Terminal was visited and its many facilities, including the telescopic covered gangways leading from the entrance vestibules of the reception halls to the ships, were examined.

The outward journey of the visit to the Liverpool Street-Shenfield electrification and Central Line extension was by the Eastern Region electrified line. Stops were made at Ilford and Chadwell Heath, from which latter point coaches were arranged to take delegates to the eastern extension of the London Transport Central Line at

Newbury Park. Inspections were carried out at Newbury Park, Gants Hill and Redbridge before the party returned by train.

An excursion was arranged on this day to Windsor and Stoke Poges.

L.M.A. Banquet

In the evening of May 21, the Locomotive Manufacturers' Association of Great Britain gave a banquet at the Savoy Hotel, London, attended by Congress delegates and many others prominent in the railways and railway industries, with their ladies. Mr. Alan Lennox-Boyd was present.

Mr. John Alcock, President of the Association, welcoming the guests, said that railways were not out of date, because of their ability to move heavy tonnages and perform certain functions. They must not, however, rest upon their laurels. Efficiency was essential, as was good railway equipment. In Britain, he added, they were proud of the locomotives they built and of their tradition in locomotive manufacture. Because, however, British Railways built most of their own engines, 90 per cent of the output of British locomotive manufacturing firms was exported.

Sir Gilmour Jenkins, Permanent Secretary, Ministry of Transport, replied for the guests. He referred to the possibility of an atom-powered locomotive. He wished all success to the British locomotive industry.

Four weekend excursions were organised. The first left Kings Cross for Edinburgh by train and continued by motor-coach to Glasgow via South Queensferry to see the Forth Bridge. The night was spent in Glasgow and on the Sunday morning a cruise on Loch Lomond preceded a cruise via Loch Long, Firth of Clyde, and Kyles of Bute to Wemyss Bay, whence the party returned by train to London. A second party followed a very similar itinerary but spent the night in Edinburgh. The train carrying this party from Wemyss Bay to Euston was delayed for 50 min. at Preston by engine failure. A further 4 min. was lost by a permanent way check. The relief locomotive, a Class 7 No. 45525, manned by Driver A. Hodgson and Fireman F. Dodd of Carlisle Upperby Depot, made up 13 min. of this lost time in the 209 miles between Preston and Euston.

Other weekend excursions were to the West Country and the Southern Counties. The West Country excursion was diverted to start from Waterloo instead of Paddington because of the dispute in the Western Region and the party spent the night at Torquay where delegates were received by the Mayor. The Southern Counties excursion spent the night at Bournemouth and the

Mayor of Bournemouth was present at an informal dinner and dance held at the Pavilion.

On May 24, Section I completed its discussion of Question 1 and commenced the study of Question 2. Mr. Caliendo, Italian State Railways, gave some explanatory remarks on summaries Nos. 1 and 2. Discussion followed after which a sub-committee was appointed to redraft the text in accordance with the remarks made. Section II heard the summaries of Mr. Warder, the Special Reporter, on Question 3 (characteristics of electric traction system), and commenced the examination of the text. Section III commenced examination of Question 5 (radiophonic communication) after the Special Reporter, Mr. S. G. Hearn, of British Railways, had given a resumé of his report and read the summaries. Section IV continued the discussion on Question 8 and passed to Question 9 (road transport). Mr. Dreyer, the Special Reporter, gave a brief resumé of the main points in his report and the meeting adjourned. Section V heard Mr. De Boeck, Special reporter, read his summaries on Question 11 (protection of electrical equipment, and so on) many of which were adopted without modification.

Visits arranged for the day included the Locomotive Testing Station at Rugby, railway protection works against sea erosion at Folkestone Warren, and the London Transport railway rolling stock overhaul works at Acton (London). A motor coach excursion from Folkestone and a visit to Cambridge University also were arranged.

Rugby Locomotive Testing Station

At Rugby the delegates saw the most modern testing station of its kind in the world, completed after the war and officially opened by Mr. Alfred Barnes, Minister of Transport, in October, 1945. The locomotives are supported on rollers, the power output being ab-



Delegates inspecting sea erosion works at Folkestone Warren, Southern Region

sorbed by hydraulic brakes; modifications designed to reduce coal consumption and to produce the most economical methods of working can be studied under laboratory conditions.

The Acton Works of London Transport were opened on January 1, 1923, and have been extended from time to time, notably in the 1935-40 new works programme. The works provide facilities for heavy overhauling and reconditioning, on a period basis, of all the railway rolling stock owned by London Transport.

At Folkestone Warren delegates saw the protection works which were described in our issue of last week, the technical booklet provided giving full details of the work with detailed drawings of the important features.

On May 25 Section I completed its discussion of Question 2 (Station Buildings). The final wording of the summaries was agreed and Monsieur Julien

(French Government) thanked the President, Mr. J. C. L. Train, for the way in which he had conducted the discussions. Section II continued the examination of Question 3 (characteristics of electric traction systems) and Section III completed the study of Question 5 (radiophonic communications). Messrs. Fraser and Dargeou, on behalf of the delegates, expressed their thanks to the President.

Section IV continued the examination of Question 9 (road transport) and Section V concluded its deliberations on Question 11 (protection of overhead equipment). Monsieur Vrielynck thanked the delegates who had taken part in the discussions and especially the reporters, Messrs. T. S. Pick and J. De Boeck.

A plenary session was held under the chairmanship of Sir Brian Robertson to deal with the ratification and renewal of various mandates, alterations to



At the Locomotive Manufacturers' Association dinner. (Left) Mr. John Alcock with Mr. D. H. C. du Plessis, General Manager, South African Railways, and in the background, Mr. J. R. Naishy. (Right) Mr. Alan Lennox-Boyd with Mr. and Mrs. F. C. Badhwar



Delegates embarking at the Ocean Terminal, Southampton, for a cruise on Southampton Water

rules, accounts, and the appointment of auditors. Summaries for Questions 1, 3, 4, 6, 7, 8, and 10 were then read and adopted.

Exhibition of Railway Equipment

In the afternoon delegates visited the exhibition of railway equipment at Willesden Motive Power Depot. On view were over 100 large exhibits including locomotives, carriages, wagons, signalling apparatus and permanent way equipment, as well as ship models and various tools and appliances. The prototype class "8" 4-6-2 express passenger locomotive just built at Crewe works was on view. This is the most powerful heavy-duty passenger engine to be designed since nationalisation and has three cylinders and Caprotti valve-gear.

B.T.C. Official Dinner

The British Transport Commission gave a dinner to delegates on May 25, at Grosvenor House, London, W.1, at which the Belgian Ambassador, the Marquis du Parc-Lochmaria, was present, with Sir Brian Robertson presiding.

After the toasts of the Queen and the sovereigns and heads of States represented, Mr. Alan Lennox-Boyd, proposing the toast of the International Railway Congress Association, stressed the interest taken in the activities of the Congress by the Royal Family and by H.M. Government. He pointed out that 1954 saw the centenary of the first railways in Australia, Brazil, and Norway, besides the East Indian Railway. He referred also to the progress in railway activities since the I.R.C.A. was founded in 1885, and since the last Congress in London in 1925.

Monsieur Marcel de Vos, President of the Congress, replying, praised the efficiency of the arrangements made for the Congress in this country, and the

apparent effortless ease with which they worked. He referred also to the courtesy of the civic officials and others with whom delegates had come into contact. On behalf of the Association and delegates, he thanked Great Britain, the British Government, the Ministry of Transport, the B.T.C., British Railways, and the British Organising Commission.

Sir Brian Robertson, proposing the toast of the guests, specially welcomed the Belgian Ambassador. Railway work, he added, knew no political frontiers, and railwaymen of whatever nationality were good colleagues. He stressed the importance of the moral

factor in railway work, and alluded to the happy relations between the Ministry of Transport and the B.T.C.

Monsieur J. Goursat, Vice-President of the I.R.C.A., referred in his reply to his long and happy association with British railwaymen.

On May 26 delegates visited a Collection & Delivery Exhibition at Marylebone. This was divided between a static display in the Wharnclyffe Room at 222, Marylebone Road, and a mobile display at Marylebone Station. The static exhibition included maps, photographs, drawings of early vehicles, documents, and models of vehicles.

The Congress was declared closed on May 26 by Mr. Alan Lennox-Boyd. Sir Brian Robertson, President of the Session, referred to the work of the Sections, and thanked H.R.H. the Duke of Gloucester, Honorary President, and Mr. Lennox-Boyd, Honorary Vice-President, for the interest they had shown, and he referred to the help he had received from Sir John Benstead as Vice-President of the Session.

Sir Brian Robertson then referred to the visits to be made by delegates on May 27 to the manufacturers of railway equipment and other products, pointing out that Britain, the birthplace of railways, had much of value to offer on attractive terms to the rest of the world. Speaking in the name of British Railways and London Transport, he expressed gratification at the response to the invitation to hold the Congress in London, and hoped that in the intervening years before the next full Congress, the railways of every country would continue to progress towards a still greater efficiency in the interests of national and international transport and of the good of mankind.



At Ilford car sheds, on the Liverpool Street to Shenfield electrified line, Eastern Region

Congress Opening Ceremony



Arrival of H.R.H. the Duke of Gloucester at Church House, showing (left to right) Monsieur P. Ghilain, Sir John Benstead, Sir Brian Robertson, and Mr. Alan Lennox-Boyd



The Duke of Gloucester delivering his opening address, with Mr. Lennox-Boyd (on the left), Monsieur Marcel de Vos, Monsieur Ghilain, and Mr. Victor Mishcon, Chairman of the London County Council



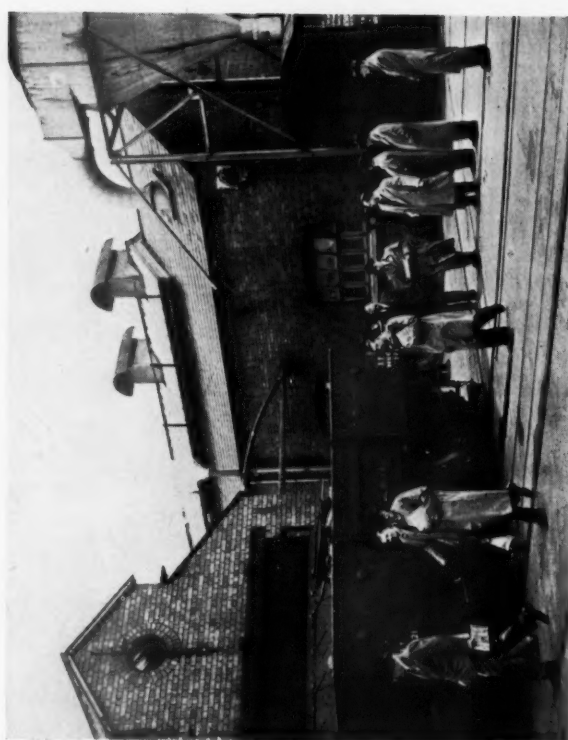
Mr. J. W. Watkins with guests at Willesden Carriage Depot, L.M.R.



Delegates during the inspection of the Locomotive and Carriage & Wagon Works, Swindon, Western Region



Delegates at Lillie Bridge Depot, London Transport



Delegates during the inspection of the Locomotive and Carriage & Wagon Works, Swindon, Western Region

British Railways Diesel-Electric Main-Line Locomotive

*2,000-h.p. for mixed-traffic operating
on the Southern Region main line*

A 2,000-h.p. 1 Co-Co 1 diesel-electric locomotive has just been completed at the Brighton Works of the Southern Region, British Railways. This is the fifth large main-line diesel-electric locomotive to be built for British Railways and is externally similar to the two earlier 1,750-h.p. Southern Region locomotives Nos. 10201 and 10202, particulars of which were included in *The Railway Gazette*, March 9, 1951, issue.

This locomotive weighs 132.8 tons of which 109.5 tons are adhesive, with a maximum axleload of 18.6 tons. The leading dimensions are identical with the two 1,750-h.p. locomotives but the starting tractive effort is 50,000 lb. and the continuous rating 30,000 lb. at 19.5 m.p.h. The maximum speed is 90 m.p.h. and the wheel diameters are as for the 1,750-h.p. locomotives.

The six driving axles are each driven by a six-pole nose-suspended motor through single reduction straight spur gearing with a ratio of 19:61. Supplies include 1,180 gallons of fuel oil, 160 gallons of lubricating oil, 280 gallons of engine cooling water, and 840 gallons of water for train heating. Westinghouse brake equipment is provided, straight air for the locomotive, and vacuum for the train.

Mechanical Parts

The underframe consists of two heavy I-section centre longitudinals, and two outer channels, joined by suitable cross bracing to form a rigid structure, the attachment of the various members being principally by welding. Four lifting lugs are provided along each side, and the decking is of all-welded steel plate. The body, of riveted and welded

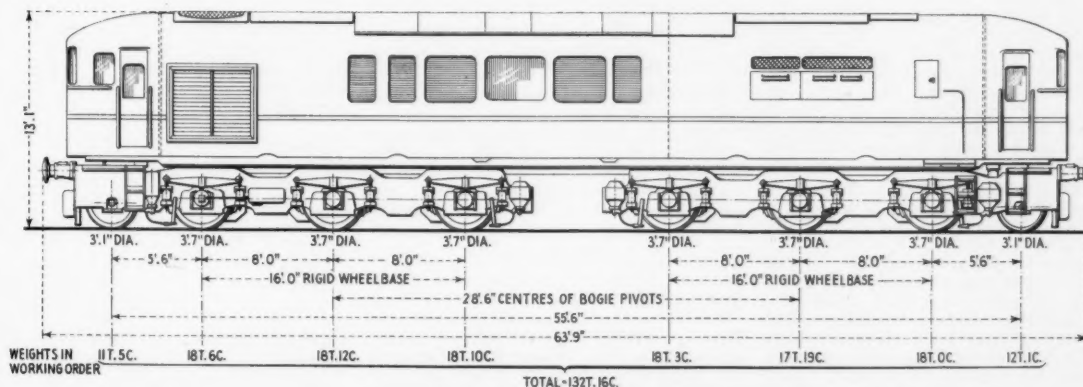
construction with a driving cab at each end, is divided into compartments for radiators, engine, electrical equipment and boiler.

Access doors are provided for through communication of the locomotive. The two main fuel tanks are carried adjacent to the engine on either side of a central gangway while water storage is provided in two side tanks alongside the electrical equipment compartment, and one auxiliary tank, formed in the centre portion of the underframe between the two main longitudinals.

The bogies are almost identical with those on locomotives 10201 and 10202, while the air brake apparatus is identical. The vacuum brake equipment differs only in the type of exhausters employed. These are two Reavell rotary machines, motor-driven, and arranged for two-speed control. Separate brake



Southern Region diesel-electric locomotive No. 10203 for main-line operating. The locomotive has a starting tractive effort of 50,000 lb. and a continuous rating of 30,000 lb. at 19.5 m.p.h.



Weights and dimensions of the locomotive

valves for air and vacuum are provided, the driver's vacuum brake valve controlling the vacuum brakes and the air brakes through a proportional valve. The straight air brake valve gives an independent locomotive brake when required.

Both driving cabs are practically identical and the controls are grouped on the left-hand side. The cabs are of welded construction and double lined to give good insulation. The driver and assistant are provided with upholstered seats, the driver's seat being adjustable for height. The power equipment controls are of the simplest and consist of two handles; the main power handle, which automatically gives full control of the engine throttle and electrical equipment, and the master switch handle, both interlocked. The latter has four positions; "off," "forward," "engine only" and "reverse," while the former gives infinitely variable (notchless) power output control.

The controls are locked when out of use by a small key which is removable. Other controls include the two brake handles, whistle and sander gear. A deadman's treadle is also provided. The instrument panel contains the main ammeter, brake-cylinder pressure gauge, air-pressure gauge, and steam-heating pressure gauge. The vacuum gauge and speedometer are mounted on a separate vertical panel. There are also two push-buttons, one for engine starting and one for exhaust control. Four indicator lights give the following indications, water temperature, oil pressure, wheel slip, boiler "on." In addition there are the switches for the markerlights, cab and interior lights, and two fire alarm indicators. The speedometer is of the Smith-Stone non-recording, electrical type.

Engine Equipment

The diesel engine is the latest English Electric Co. Ltd., 16-cylinder vee-form four-stroke pressure-charged engine, type 16SVT/II, and is the latest version of the 10 in. x 12 in. RK and VT series. The continuous traction rating is 2,000 b.h.p. at 850 r.p.m. and the input to the

main generator, after allowing for all auxiliaries is reckoned to be 1,880 b.h.p. The corresponding b.m.e.p. is 123 lb./sq. in. and the piston-speed 1,700 ft./min. The engine weight is 46,510 lb. or 20.2 lb./b.h.p. and the weight of the power-unit complete is 28 lb./b.h.p.

The engine has four, Napier type, T.S.100/4 turbo-superchargers, and the cylinder heads have two exhaust and two air vales. Push rods and rocker gear are of conventional pattern, enclosed in individual aluminium casing covers for each head. The governor is of the variable-speed hydraulic servo-type, and is driven through bevel gears from one camshaft. It is arranged for remote operation from the master controller by compressed air and is so designed as to give full torque control from 450 to 850 r.p.m. Idling speed is set at 470 r.p.m. The four turbo-superchargers draw air from outside the locomotive body through Air Maze panel-type intake filters. There are no silencers on intake or exhaust side.

Transmission

Electrical transmission and control is of the normal English Electric type. The ten-pole main generator is direct coupled to the engine and the outer end of its shaft is supported on a self-aligning roller bearing. The shaft is extended to carry the armature of the auxiliary generator. At 850 r.p.m. the continuous rated current is 1,750 amps. and the maximum voltage is 965. It is a self-ventilated machine with the fan attached to the engine flywheel and barring ring; the frame is of welded steel.

The auxiliary generator is overhung from the main generator, the frame being bolted direct to the main generator bearing endplates. It has no bearings and is an eight-pole, d.c. shunt wound machine, rated at 48 kW, 135-V, 356 amps. at 850 r.p.m. It supplies current to all auxiliaries, except the radiator fan motor, and current for charging the 60 cell 236 amp-hr. lead-acid battery.

The six traction motors are of the six-pole series wound type force-ventilated, three motors being ventilated from each of two motor-driven blowers. The

motors are permanently connected in series-parallel there being three groups of two in series—each group is fed through a separate motor contactor. There are three stages of field weakening by non-inductive shunt, and the minimum field is 25 per cent.

Control equipment consists of electro-pneumatic and electro-magnetic unit and group switches, the main power contactors and reverser being of the electro-pneumatic type. The engine throttle gear is pneumatically operated from the master controllers, giving infinitely variable control. This control permits the utilisation at all speeds of the full power output available from the engine, allowing it to function at all fractional loads, and prevents overloading of the engine as well as automatically controlling the field weakening of the traction motors at the correct instant. The load regulating equipment is basically the same in operation as that installed in the first two Southern Region locomotives Nos. 10201 and 10202, except that it operates over the full engine speed range instead of at the top engine speed only.

Train Heating Equipment

A vertical water-tube oil-fired boiler is installed for supplying steam for train heating. This boiler is capable of producing a maximum of 2,400 lb. of steam per hr. at 80 lb./sq. in. pressure, but set to give 1,800 lb./hr. for this application. It was designed and built by British Railways in conjunction with Laidlaw-Drew & Co. Ltd. who provided the automatic oil fuel and burner apparatus.

The burner equipment is of the firm's steam-jet, forced-draught type, and is arranged to give fully automatic control over a wide range of operation. The mechanical parts were built at the Ashford and Brighton Locomotive Works of the Southern Region. The power equipment was supplied and erected by the English Electric Co. Ltd. The whole of the equipment was designed to the requirements of the Mechanical & Electrical Engineer, Southern Region, British Railways.

CHEAPER MID-WEEK TRAVEL.—The special mid-week tickets at "matinee" prices introduced experimentally last autumn between British Railways stations in Yorkshire and Lancashire to attract additional traffic at off-peak periods are to be extended to other areas. Passengers may travel outward on a Tuesday, Wednesday, or Thursday, and the tickets enable them to return on Tuesday, Wednesday or Thursday within 17 days of the outward journey. Three new mid-week travel tickets schemes will come into operation as from June 1. They will operate between principal stations in the North East and Barnsley, Chesterfield, Rotherham and Sheffield; between the West Riding, Hull, and the main North East stations; between main North-East and West Riding stations, Hull and London (Kings Cross). Under the first two schemes passengers will be able to travel by any train, but mid-week tickets to and from London will be by

specified trains only. Examples of the fares are Durham-Barnsley 20s. 6d. (ordinary third class return 30s. 4d.), Newcastle-Halifax 21s. (31s. 10d.), and Newcastle-Kings Cross 45s. (78s. 6d.).

VEHICLES OF SOUTH AFRICAN RAILWAYS.—Large-scale reconstruction projects being put into operation by the South African Railways have called for the use of 44 Leyland Hippo six-wheel tipper and haulage trucks now being delivered by Leyland Albion (Africa) Limited.

DISPOSAL OF TRANSPORT UNITS.—The Road Haulage Disposal Board and the British Transport Commission announce that of transport units offered for sale in List No. 4, advertised on March 22, 254 general units, with 654 vehicles, will be sold for the highest tenders submitted. All tenders were rejected for 71 units (275 vehicles), no bids were received for 36 units (167 vehicles), and nine

cases (36 vehicles) were undecided. Of contract hire units on the list, the highest tenders were accepted for 26 (43 vehicles), all tenders rejected for eight units (49 vehicles), and no bids were received for 30 units.

EXPERIMENTAL CHEAP FARES.—Reductions of between 20s. and 30s. on the present third class return fare are to be given by the London Midland Region of British Railways from Euston to several places in North Wales and to Morecambe and certain Lakeland resorts on Saturdays June 19 and 26 and July 3 and 10. Tickets will be available for eight or 15 days by selected services only. This is stated to be an experiment during a quiet period when there is a certain amount of spare accommodation on "The Welshman" and "The Lakes Express." It will be necessary for tickets to be booked in advance of the day of travel.

RAILWAY NEWS SECTION

PERSONAL

Mr. P. J. Dawes, M.I.Loco.E., is now Chief Mechanical Engineer of the Antofagasta (Chili) & Bolivia Railway (Chilean Section), which also operates the Chilean Northern and Aguas Blancas railways.

A memorial service for the late Mr. Edmund Graham Clark, C.B.E., M.I.C.E., Secretary of the Institution of Civil Engineers, whose death on April 23 was recorded in our April 30 issue, was held at St. Margaret's, Westminster, on May 17. The service, which was attended by a large company of engineers, was conducted by Canon Charles Smyth, and an address was given by the Dean of Westminster.

Mr. Hugh Molson, M.P., Joint Parliamentary Secretary to the Ministry of Transport & Civil Aviation, has appointed Mr. J. R. Steele to be his Private Secretary with effect from May 20, 1954, in succession to Mr. J. H. H. Baxter.

Mr. W. E. Merchant, Chief of Pass Bureau, Canadian Pacific Railway, arrived in this country on a short visit on May 25.

Mr. A. E. Goodwin, Chief clerk of the London City office of the Canadian Pacific Railway, retired recently after almost a half-century of service.

Mr. Lloyd A. Rager has been appointed Advertising Manager for LeTourneau-Westinghouse Company succeeding Mr. Joe H. Serkovich who becomes Advertising & Publicity Director for Westinghouse Air Brake Company.

Mr. John Palmer has been appointed resident Public Relations & Publicity Representative for Southern Ireland, attached to the staff of Mr. G. B. Gray, General Agent in Dublin for British Railways. Mr. Palmer took up his new post on May 17.

Mr. H. S. Chapman, Treasurer of London Transport Executive, has retired after 50 years of railway service.

He has been succeeded by Mr. H. W. Aldridge, A.M.Inst.T., Deputy to the Treasurer, who thus becomes an Officer of the Executive.

Mr. K. B. Rao, Director-General, India Store Department, 32/44, Edgware Road, London, W.2, has been elected a Member of the Institution of Locomotive Engineers.

Mr. N. W. Porteous, A.M.I.Mech.E., M.I.Loco.E., Assistant Chief Mechanical Engineer, Sudan Railways, is retiring.

Mr. C. A. Turner, M.I.Loco.E., has been appointed Assistant to the Chief Mechanical Engineer & Workshops Superintendent, Ipswich, Queensland Railways.

Mr. N. M. Thadani, Deputy Chief Engineer, Central Railway, India, who, as recorded in our May 14 issue, has been appointed Chief Engineer of the system with effect from March 26, was born in Hyderabad, Sind, in 1903. After passing his Inter Science examination Mr. Thadani came to the United Kingdom for higher technical education in 1923. In 1925, after obtaining the degree of B.Sc. from Edinburgh University, he joined the



Mr. N. M. Thadani
Appointed Chief Engineer,
Central Railway, India

London Midland & Scottish Railway as an Assistant Engineer. On his return to India Mr. Thadani was appointed an Assistant Engineer on the Great Indian Peninsula Railway in 1927, being promoted District Controller of Stores in 1939. Mr. Thadani worked as an Executive Engineer from 1940 to 1947, when he was promoted to be Deputy Chief Engineer, and put in administrative charge of the work of removal of infringements on the Bhore and Thull Ghats, which entailed the construction of several new tunnels and widening, and day-lighting of tunnels under traffic, in which many new techniques of engineering construction were adopted. He has recently completed the construction of a new mountain railway across the Vindhyas, from Budni to Barkhera, near Bhopal, which was opened to traffic in February, 1954.

Mr. L. C. Hoare has been appointed Manager of the Purchasing Department, Head Office of Shell-Mex & B.P., Limited.

Mr. C. Nichol, M.Inst.T., retired at the end of April from his position as Transport Manager of Imperial Chemical Industries Limited, Billingham. He has been succeeded by Mr. A. J. V. Merritt.

TRANSPORT USERS' CONSULTATIVE COMMITTEE FOR THE EAST MIDLAND AREA.

Mr. S. C. Bond, M.Inst.T., who is a representative of industry, has been appointed to serve for a further period as a member of the Transport Users' Consultative Committee for the East Midland Area. Mr. Bond is Transport Manager of Stanton Ironworks Co. Ltd. He is also a Fellow of the Industrial Transport Association; Member of Transport Committees of the British Iron & Steel Federation and British Coking Industry Association; Vice-Chairman of Traffic Section, Nottingham Chamber of Commerce; Member of Traders Panel, Railway & Traders Conference (Nottingham, Leicester, & Derby Area); National Vice-Chairman of Traders Road Transport Association; Member of National Council and Executive Committee and Chairman of East Midlands Area of that Association.

Mr. R. O. Banister, Divisional Operating Superintendent (Central Division) Manchester, London Midland Region, British Railways, is retiring at the end of this month.

Mr. D. L. Pollock has joined the board of Vickers Limited.

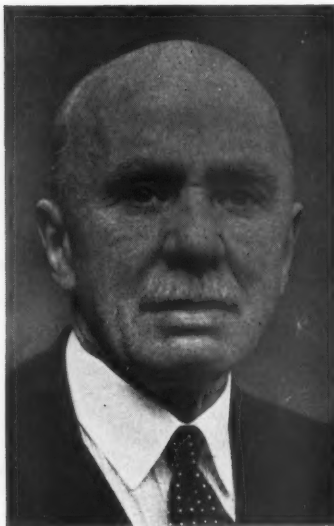
Mr. B. J. Haill, Works Manager of the Hirwaun foam-rubber factory of the Dunlop Rubbber Co. Ltd., has been appointed, in addition, General Works Manager of the new factories at Brynmawr and Cwmavon, which the Dunlop company has just taken over from Enfield Cables, Limited. Mr. J. H. Lord, a Director of the Dunlop company, has been elected a Director of the Dunlop Tire & Rubber Corporation, Buffalo, U.S.A.

Mr. G. W. Robson, A.M.I.Mech.E., M.I.Loco.E., who, as recorded in our April 30 issue, has been appointed District Motive Power Superintendent, Worcester, Western Region, British Railways, began his railway career at Bristol in 1928 as an apprentice at Bristol Motive Power Depot & Shops, moving to Swindon Works in 1932. After completion of his apprenticeship he transferred to the Chief Mechanical Engineer's Test House & Drawing Office in 1934, and served for a period on the Experimental and other sections. Mr. Robson was appointed Assistant Divisional Locomotive, Carriage & Wagon Superintendent at Worcester in 1941 and, in 1950, he transferred to Wolverhampton as Assistant Motive Power Superintendent, which post he now relinquishes upon taking up his new appointment of District Motive Power Superintendent at Worcester.



Mr. H. G. Broadman

Secretary, Coras Iompair Eireann,
1945-54



Mr. C. H. Slater

Civil Engineer, Great Northern Railway Board,
who has retired



Mr. W. H. Copeland Stone

Appointed Civil Engineer,
Great Northern Railway Board

Mr. H. G. Boardman, Secretary, Coras Iompair Eireann, who, as recorded in our May 7 issue, is retiring after 44 years of railway service, began his railway career in 1910, when he joined the Waterford & Tramore Railway as Accountant. Fifteen years later, on the amalgamation of the Irish railways in 1924, he was transferred to the Secretary's Department of the Great Southern Railways Company at Kingsbridge, Dublin, where his duties were associated mainly with the fusion of the undertakings. In 1928 he became Chief Clerk in the department, and, in 1942, he was appointed Secretary. He became Secretary, Coras Iompair Eireann, when that body was formed in 1945, and, five years later, in 1950, when transport in the Republic was placed under the control of a Board nominated by the Government, he was appointed the Secretary of that body. This is the present Board of Coras Iompair Eireann. Mr. Boardman has for many years been Secretary of Transport Subsidiary Limited—a company the main activity of which is the trusteeship of the Coras Iompair Eireann Staff Superannuation Funds.

We regret to record the death on May 15, at the age of 59, of Mr. Douglas Digby Hawley, Sales Director of Hadfields, Limited.

Mr. R. M. W. Grant, B.Sc.(Eng.), M.I.E.E., M.I.Mech.E., A.M.I.I.A., has been appointed Manager of the Transformer Works at Witton of the General Electric Co. Ltd. in succession to the late Mr. C. H. Nunn.

Mr. W. H. McFadzean, C.A., Deputy Chairman & Chief Executive of British Insulated Callenders' Cables Limited, will become the Chairman of the company on the retirement of Sir Alexander Roger, K.C.I.E., on June 10, 1954.

Mr. E. W. Voice has been appointed head of the Ironmaking Division, in succession to Dr. H. L. Saunders, who has retired because of ill-health. Mr. Voice, who was on the B.I.S.R.A. staff from 1946 to 1951, is at present Assistant Director of the National Coal Board's central research establishment at Isleworth.

Mr. Charles H. Slater, M.Inst.C.E.(I), M.I.Struct.E., Civil Engineer, Great Northern Railway Board, who retired from the service of the board on March 31, was appointed Civil Engineer of the Great Northern Railway (Ireland), in March, 1939. He began his engineering career with A. Handyside & Company, bridge and structural engineers, Derby, where he gained valuable experience in the design of all types of bridges and other work. In 1910 he joined the Great Northern Railway (Ireland), as Steelwork Assistant to the then Chief Engineer (Mr. F. A. Campion), and, in 1924, became Mr. Campion's Chief Assistant. During this period the majority of the more important bridges on the system were reconstructed, and Mr. Slater under the Chief Engineer was responsible for their design and erection. He also assisted Mr. G. B. Howden in the reconstruction of the Boyne Viaduct at Drogheda. Mr. Slater served with the Royal Irish Rifles (Pioneer) Battalion in France and Belgium from 1915 until about six months before the end of the 1914-18 war, when he was transferred to the Air Ministry. He was awarded the Military Cross and was demobilised with the rank of captain.

Mr. I. T. Awosika has been appointed Assistant Carriage and Wagon Superintendent, Ebute Metta Works, Nigerian Railway

Mr. G. R. Marsh, who has been a Director of Wickman, Limited, for 14 years, has been appointed Managing Director of the company.

Sir George Briggs, A.M.I.Mech.E., has accepted an invitation to become a director of the Brush Group, Limited. Sir George Briggs is a Director of Tube Investments, Limited, and is a member of the Royal Ordnance Factories board. He was Deputy Controller, Iron & Steel Supplies, at the Ministry of Supply, 1942-45, and Deputy Controller of Supplies (Munitions Production), Ministry of Supply, 1951-52.

Mr. William H. Copeland Stone, B.A., B.A.L., District Engineer, Great Northern Railway Board, Enniskillen, who has been

appointed Civil Engineer, G.N.R. Board, was educated at the High School, Dublin, and Trinity College, Dublin. Mr. Stone joined the Great Northern Railway (Ireland) on May 10, 1920, as Assistant to the District Engineer at Dundalk; he was a pupil under the then Chief Engineer, Mr. F. A. Campion, during 1919-20. On October 1, 1926, he was appointed Assistant to the District Engineer at Enniskillen, and, on February 1, 1942, he became District Engineer there. Mr. Stone served with the Royal Engineers in France during the 1914-18 war, and was twice mentioned in dispatches.

INSTITUTION OF MECHANICAL ENGINEERS

The following have been elected Associate Members of the Institution of Mechanical Engineers:—

Mr. Donald McLeod, B.Sc.(Eng.) (Lond.), General Engineering Division, Brush Electrical Engineering Co. Ltd.

Mr. E. E. Laird, Shops Assistant at Lillie Bridge Depot of the London Transport Executive.

Mr. Eric Russell Parsons, Carriage & Wagon Department, Cowlairs Works, Glasgow N., British Railways.

NORWEGIAN RAILWAY CENTENARY.—The bust of G. P. Bidder, engineer of the first railway to be built in Europe, referred to in our May 14 issue, was presented last Wednesday by Mr. C. E. R. Sherrington to Mr. H. E. Stokke, General Manager of the Norwegian State Railways, at a ceremony in the board room of *The Railway Gazette*.

PADDINGTON CENTENARY.—A tablet is to be unveiled tomorrow (Saturday) on No. 1 platform at Paddington Station to commemorate the centenary of the opening of the station in 1854. The departure side was opened on January 16 of that year, but the roof and arrival side were far from finished at that date. On May 29 of the same year the arrival platforms were brought into use and the passenger facilities were transferred to the new station, of which all the principal works had been completed.

Ministry of Transport Accident Report

Between Wilnecote and Kingsbury, August 16, 1953; British Railways, London Midland Region

Colonel W. P. Reed, Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, inquired into the accident which occurred at about 1.15 p.m. on August 16, 1953, between Wilnecote and Kingsbury, when the 9.28 a.m. express, Bradford to Bristol, consisting of nine bogie coaches drawn by class "6P" 3-cylinder 4-6-0 locomotive No. 45699, travelling at about 55 m.p.h., became derailed completely on plain straight track. It parted between the second and third vehicles and the first portion came to rest well ahead of the rear. There was no structural damage to the coaches although the engine fell on its side. All coaches had steel underframes with standard screw couplings and long stroke shock absorbing buffers. The first and third had welded bodies, the remainder steel panelled ones on hardwood frames. Of over 450 passengers only two required hospital treatment for concussion and shock. Driver and fireman were unhurt. Assistance was speedily summoned. Both lines were blocked. The up was quickly repaired but was needed for the cranes and not reopened until 10.42 a.m. next day, the down was in service by 6.37 p.m. It was fine but not exceptionally hot, and Colonel Reed is satisfied that there was no heat distortion of the track. The rear seven coaches were derailed to the left but remained coupled together and maintained direction well. Only in the last few yards had the leading coach drifted so far to the left that its wheels had dropped into the drainage channel and the side made contact with the slope. Only the leading coach suffered damage to the bodywork.

The front part of the train, consisting of engine tender and two coaches, stopped 116 yd. ahead of the rear part with the second coach on the rails just past the diamond crossing of a siding. The first coach was upright, coupled to the second with both bogies derailed to the left. The tender was still coupled to the coaches but pointing to the right, at 30 deg. to the horizontal.

The report contains details of wheel and other marks, etc., found on these two coaches and refers particularly to the condition of the bolster of the rear bogie of the second of them and the wear on two pins in the cross member of the bogie frame. It is considered that this was insufficient to have jammed the bolster and Colonel Reed is satisfied that there was no sign of that having taken place. On this journey the badly fitting pin heads on the trailing cross member were not in contact with the bolster. All coaches in the train except the third had received a works overhaul during the preceding 12 months and the third was not due for that. The springs of the first three coaches were intact although some deflected more than the designed amount. The engine was little damaged. It had run nearly 42,000 miles since intermediate repair at Crewe in January, 1953. Tyre profiles were fair, with some wear on the left-hand leading bogie wheel, and all axle boxes were perfectly free in the horns with no sign of heating in the journal bearings. Lateral axle play was nowhere excessive, but on the tender play had increased considerably beyond the designed amount. Important discrepancies, however, were

found in the bearing springs of the engine itself and wheel loadings of both engine and tender. The left-hand bogie spring had three broken and three cracked plates out of 17, all old fractures and deflected more under load than the specified amount, and 13 per cent more than the opposite spring. There was a maximum variation of 10 per cent in the load deflection rate between pairs of springs on the coupled wheels. Weight on the left-hand driving wheel was 2 tons 1 cwt. less than on the right hand, and on the right-hand trailing coupled wheel 2 tons 2 cwt. less than on its fellow, a difference of about 20 per cent in each case. The tender trailing wheels also were unevenly loaded with 1 ton 10 cwt. less on the right than the left, or 25 per cent difference. There was no significant loss of strength in the bogie side controlling springs and the slide was in good order.

The Permanent Way

This was 95-lb. R.B.S. bull-head with 24 sleepers to each 60-ft. rail laid new in 1943 and worn to 85-lb. Sleepers and rails were approaching the end of their life and renewal was proposed for 1955. The track was well ballasted with stone and the whole length had been drained, cleaned, and reballasted in 1951, with mechanical equipment, to overcome the difficulties in maintenance caused by clay soil, but in places the ballast was not up to the top of the sleepers. At the same time the line was regraded with special chairs and oversize coach screws where necessary. The diamond crossing and single slip at the siding had been relaid in 1951 with 109-lb. f.b. material.

The Permanent Way Inspector said the line had been in poor condition and given much trouble until the 1951 overhaul. The present ganger had been put in charge in that October and the line had improved. It was now in good order with nothing to warrant special precautions. He made a thorough examination on July 14 and found practically nothing to bring to the ganger's notice. He walked through on July 23 and rode on the footplate on July 31. He found nothing to notice.

The report gives a detailed account of the various marks found on the track and damage done throughout the length concerned, as far as could be ascertained, the whole track having been broken up for 260 yd. in rear of the diamond crossing and damaged for 60 yd. beyond it. The track showed evidence of unstable running for some distance before the site of the derailment with bright marks on the running edges of both rails at intervals without, however, any clear pattern being apparent in the relation between the marks, although they alternated to some extent. The last five overlapped the first two of 12 lateral track distortions. These were small, none exceeding $\frac{1}{2}$ in., occurring alternately right and left with an average pitch of 76 ft.; those to the right were less than those to the left. The last of all was to the right and at its maximum about 23 ft. before the beginning of a diagonal groove 26 ft. 5 in. long in the head of the left-hand rail, the first sign of derailment.

Cross levels were measured for rather more than a mile in rear and showed variations from $\frac{1}{4}$ in. to 1 in. high.

The driver took over at Derby and found the engine in good order and running steadily. He made no comments about the track except at the approach to one station where there had been "a bit of bad pitching for some time." Approaching the scene of the derailment he noticed a drag and thought the train "seemed heavier."

Thinking some part might be off the track he braked, intending to stop gradually. He then heard the first coach jumping up and down and knew it was derailed, but felt sure engine and tender were not. The tender slewed to the left as the train was slowing down and "fetched the engine off." They had stopped when it went over. He did not look back and was unaware of the train parting. Probably he braked before that. He insisted that engine and tender did not ride roughly at any point except where above mentioned, and were not derailed until the very end.

The fireman generally confirmed this, but thought that at one point the tender "seemed to rock over to one side and pull itself back." He thought a coach was derailed. Both men were standing on the engine itself the whole time.

Colonel Reed recalled these witnesses and told them about the track distortions and his opinion that they could have been caused only by severe lateral oscillation of the engine, but both men affirmed again that they noticed no signs of nosing or rolling approaching the site of the derailment; they were certain there was no lurch at any point where cross level was found to be bad.

The guard, in the rear brake van, said the train ran normally until he felt a normal application of the brake followed by a severe jerk; he then saw a coach to be jumping up and down. He was about to apply the brake himself when his coach was derailed. The crew of the previous train, which passed about 1½ hr. earlier, experienced no unusual lurching. The driver said there was a little oscillation, never serious enough to require reporting, at one or two places.

A passenger and an Assistant Controller travelling in the train gave evidence. The latter noted no undue motion before the lurch preceding the accident.

The Course of the Derailment

Colonel Reed found himself unable to reconcile some of the evidence regarding the train running with the material results, as measured and recorded. He considers that the pattern of track distortion could have been caused only by the lateral oscillation of an engine and is satisfied that the one involved was that of the derailed train. He refers to the report of the Pacific Locomotive Committee, which investigated the running of certain engines in India in 1938, and sets forth the definitions used therein.

This committee pointed out that while neither track nor engine can be perfect, the better the one the less perfect the other can be, but if the total of all imperfections exceeds a certain value there is first abnormal movement of the engine, then deformation of the track and thereafter derailment. If, however, the engine is defective, rails

may break, the gauge spread, or the road as a whole become distorted, although the track itself is good. Whilst derailment may not result the engine is exceedingly mischievous in its effects and unsatisfactory as a vehicle. On the other hand, if the track is badly designed, weak, or inefficiently maintained the same effects may become apparent even if the locomotive has been correctly designed and carefully maintained.

Weighing all the factors involved and the evidence, Colonel Reed formed a theory of the course of the derailment which is set forth in complete detail in the report, but is difficult to summarise in a short space. It means, however, that the engine began nosing and hunting in increasing fashion until a tender wheel mounted the rail and this was followed by damage to the track and the shearing of fishbolts and loosening of a rail, over which the first two coaches passed before the bolts fell away. The trailing bogie of the first coach and leading one of the second probably were derailed in the first damaged rail length, as a rail shifted outwards. The leading bogie of the third coach became caught by a levered-up rail and the rear seven ran off in the gap and came to a stop fairly steadily in about 153 yd. or 13 sec. of time. The front part of the train travelled 200 yd. after the division before the derailed wheels of the tender were diverted at the crossing.

Another theory was suggested to Colonel Reed involving a possible jamming of the bolster of the rear bogie of the first coach, due to the faulty fittings to which reference has been made, but he was unable to find any signs of that, while had there been such jamming the effect on the general running of a vehicle on straight track would have been very small indeed. This theory was based on an interpretation of certain diagonal marks on both leading wheels of this bogie, but Colonel Reed is satisfied they were made some time later, after derailment occurred, and feels he cannot accept it. He advances a number of facts to support the theory.

Inspecting Officer's Conclusion

Colonel Reed is satisfied that the engine was hunting on the approach to the point of derailment and for some distance past it and that this distorted the track. The mark on the left-hand rail caused by a flange indicated that the wheel concerned was not an engine wheel, although derailments caused by hunting generally begin at the leading coupled wheels. Side to side motion of the rear of the engine caused the tender to oscillate and this was enhanced by the side play from the wear in the axle box bearings and distortion of the track caused by intermittent lateral pressure between the flanges of the four end wheels and the rails. This became excessive at the rear left-hand wheel, causing it to mount.

The hunting was caused, it is considered, by the significant variations in cross level some distance back, followed by lesser ones coinciding with the period of hunting of the engine, and partly by uneven loading of its bogie and coupled wheels which, with the tender axle side play, made it less stable.

The driver's evidence about the steadiness of the engine is at variance with the physical evidence of hunting, which though track distortions were small, must have been appreciable. The driver did not notice the lurching which must have occurred over the uneven track at two places, and Colonel Reed finds it therefore

less difficult to discount his evidence about no tender wheel becoming derailed until after the division of the train.

Remarks and Recommendations

Neither engine, tender, nor track faults were such as to be dangerous in themselves. The train probably would have passed safely had it been going a little slower or faster, or the engine been pulling harder. Nevertheless a combination of these faults gave rise to derailment.

The permanent way staff appeared to give considerable attention to gauge and fastenings on this old track, which had begun to give trouble, but were not so concerned about cross levels. The two bad places may have developed since the inspector's last footplate trip, when they would have been attended to as soon as detected, but it is probable some of the lesser variations existed for some time. They may not have seemed important enough to merit special attention, considered separately, but in relation to one another their importance became clearer. It was not difficult to detect a pattern in them. Colonel Reed considers that the two large ones soon would have become dangerous in themselves if not put right. The alternations along the straight track,

more or less in phase with the nosing period of the engine, were objectionable and shown by signs of uneven running. He recommends that the attention of permanent way staff be drawn to this.

Engines of this design have been running for many years on expresses, with an excellent record for steadiness. The condition of this one was fairly good. Play in axle boxes and journals was no more than was to be expected, but variations of wheel load were greater than they should have been. Colonel Reed thinks this uneven loading was present before the derailment, for various reasons; the engine was last weighed at shops in January.

On the tender considerable lateral play had developed between the wheels and the frame and this must have reduced its steadying effect on the engine and enhanced amplitude and severity of any lurch or oscillation. The defective bogie springs and uneven loading of wheels were faults which, it is considered, should have been checked and put right. More frequent weighing of engines may be desirable so that partially broken, weak, or maladjusted springs may receive attention. It might also be considered whether tender brasses should be changed more often to prevent undue lateral axle play.

The Brush Group Limited

(Formerly The Brush Electrical Engineering Co. Ltd.)

Remarkable success of new Mirrlees engines

The 65th annual general meeting of The Brush Electrical Engineering Co. Ltd. was held on May 20, in London, Sir Ronald W. Matthews, D.L., M.Inst.T. (the Chairman), presiding.

In his statement circulated with the Report, the Chairman said:

"The year under review has been a period of keen price competition both at home and particularly in the overseas markets. A fall in turnover has been inevitable but the rate of gross profit earned on this reduced turnover by the Group's English factories was almost the same as in 1952.

Change of Name

"During recent months we have adopted for Group publicity purposes the title 'The Brush Group.' The significance of the former title 'BRUSH ABOE GROUP' was frequently misunderstood and your Board considered it desirable that a simpler title should be adopted. The Board are now recommending that the name of the Company should be changed to 'THE BRUSH GROUP LIMITED'."

In the course of a review of the Group's widespread manufacturing activities, the statement continues:—

"Brush Bagnall Traction Limited has delivered five pilot main-line locomotives for the Ceylon Government Railway for trial purposes and these have run nearly 400,000 miles in commercial service. Instructions to proceed with the remaining twenty locomotives on this contract have now been received. They have amply demonstrated the economies resulting from the replacement of steam by diesel-electric traction. Contracts for shunting locomotives for the Steel Company of Wales and the National Coal Board are proceeding satisfactorily.

"Now that the danger of power cuts has lessened, the home market demand for 55-kW. diesel-electric generating sets

manufactured by J. & H. McLaren Limited has dwindled. Steps are being taken to fill the gap in production capacity with a new range of low-powered generating sets and a newly-designed medium diesel engine. The welding shop at Leeds is now doing large and intricate fabrications up to 12 tons in weight under sub-contract, while McLaren's are also manufacturing, on behalf of The National Gas and Oil Engine Co. Ltd., a range of large gear boxes up to 1,000 s.h.p.

"The year 1953 has been outstanding in the history of Mirrlees Bickerton & Day Limited. Under new management this factory has proceeded with the task of putting the new range of "J" and "K" engines fully into production. A high target was set in order to overtake the delivery situation. The target was not only achieved but surpassed, and the profit budget for the year was also exceeded.

"The success of the new Mirrlees range of engines has been remarkable; particularly that of the largest unit, an engine of 3,000 b.h.p. One of the major features of this outstanding engine is its low fuel consumption. Orders for these engines have been received from B.E.A. and many other electricity undertakings throughout the world. In the "J" range the 100th engine for the Admiralty defence contract was despatched from the factory at the end of 1953. The management of the Stockport factory is to be congratulated on the achievements of a remarkable year.

Well-equipped Organisation

"We have entered the New Year with a not unhealthy order book, and with satisfactory prospects in most of our traditional markets and others that we are vigorously assailing."

The report was adopted and the proposed change of name to "THE BRUSH GROUP LIMITED" was approved.

B.T.C. Passenger Charges Scheme, 1954

Opening of hearing before Transport Tribunal

The Transport Tribunal commenced the hearing of the British Transport Commission Passenger Charges Scheme, 1954, on May 18, in London. The application was lodged on April 1. Mr. Hubert Hull, the Chairman, announced at the opening meeting that there would probably be an adjournment after the Commission had presented its case to enable the objectors and the Commission to review the position. There are 19 objectors to the scheme, including the London County Council.

Mr. Harold Willis, Q.C., presented the case for the B.T.C. He said it had been accepted by the Tribunal and by most objectors that the London area must pay its way, and the number of objectors had in fact fallen from over 90 to 19. Mr. Willis said that the cheap evening fares recently introduced in the London area had, generally, produced a substantial increase in traffic. Revenue, however, had not kept pace and there was a small loss as far as London Transport was concerned. This showed the inherent difficulties of the matter, and the fallacy of assuming that extra traffic would produce extra revenue.

He said that after confirmation of the last charges scheme in 1953 a small surplus of £600,000 was expected. Since last July, the commission had been overtaken rapidly by circumstances beyond their control. Towards the end of 1953 London Transport, instead of having a small surplus, was faced with a substantial deficit. Very substantial wage increases were authorised towards the end of 1953, and the position was also affected by a continuation of the falling trend of traffic. The London lines of British Railways were faced with similar difficulties.

In the year which would begin in the autumn of 1954 it was estimated that London Transport receipts would exceed working expenses by £2,200,000, but after deducting £5,500,000 for central charges, there would be a loss of £3,300,000. The proposed fare increases would yield £4,300,000, thus producing a surplus of £1,000,000.

Net Deficit

On the London lines of British Railways there would be a net deficit of £200,000, increasing with the addition of central charges, to £2,200,000. The proposed increases would yield £1,000,000, thus leaving a deficit of £1,200,000. The net result for the London area would be a shortfall of £200,000. It was clear that the London area was not paying its way. The Commission submitted that an increase of fares was the only solution and that those now proposed were the best way of providing the extra revenue with fairness to all users.

Mr. Willis said that the L.C.C. and 11 other objectors thought that no increases should be permitted until the committee of inquiry into London Transport had made its report. As this was *sub judice* he did not propose to go into the matter.

Sir Reginald Wilson, a Member of the Commission and chairman of its finance committee, said that he thought that so long as the spiral of cost continued there would be a spiral of fares.

He denied emphatically that there was discrimination against London passengers, and said that this was in essence a "stopgap" scheme.

Giving evidence on the second day, Mr. P. G. James, Chief Financial Officer of the London Transport Executive, said that

London Transport gross receipts for the 12 months beginning in the autumn of this year, without the increases in fares which were being asked for, were estimated at £71,000,000, and working expenses at £70,100,000, giving net receipts of £900,000.

Estimated net receipts expected from the last scheme as approved by the tribunal were £4,500,000. The figure of £900,000 thus meant a worsening of net receipts, as compared with expectations, of £3,600,000, made up of a reduction of £1,700,000 in traffic receipts and an increase of £1,900,000 in working expenses.

Wage increases involved an additional annual cost of £2,200,000 to London Transport, and a pension scheme for wages staff to come into operation later this year would cost £200,000. This total increase of £2,400,000, stated Mr. James, had been partly offset by variations in price levels of major commodities and by economies in mileage, reducing the increase in working costs to £1,900,000.

Decline in Passenger Traffic

Mr. A. B. B. Valentine, a Member of the London Transport Executive, said that a basic decline in passenger traffic in the London area had been going on independently of increases in fares.

During the period from January 1 to August 15, 1953, he said, the decline, compared with estimates which had previously been made for the period, amounted to 1.21 per cent.

Reasons for the decline included the growth of private motoring, and television, which tended to keep people at home. He thought that they were also still losing some traffic because of the improved housing situation and the transfer of population to country areas from inner London. Mr. Valentine said that passenger receipts from London Trans-

port services for the 19 weeks from January 1 to May 16 this year were below the due proportion of the year's estimate by £188,000, or 0.7 per cent.

Just under 80 per cent of passenger receipts of the London Transport Executive were derived from ordinary fares, and it was inevitable that the bulk of increased revenue now sought must come through increases in these fares.

The president of the tribunal, Mr. Hubert Hull, said that he did not like the proposed increase of 9d. in the weekly season ticket rates, and asked for figures showing the proportion of season ticket revenue.

At the end of his evidence, Mr. Valentine gave figures which showed that 24 per cent of London Transport's season-ticket revenue came from weekly season tickets, 30 per cent from monthly, and 46 per cent from quarterly tickets.

Mr. Harold Willis, Q.C., said that concluded the evidence-in-chief, and the Tribunal adjourned until May 26.

WESTERN REGION FIRST AID COMPETITION FINALS.—The finals of the Western Region First Aid Competition were held in the Porchester Hall, Paddington, on May 11. The winning team was Shrewsbury Loco "A," with 429½ points, and the runners-up were Swindon "A" with 429 points. Mr. K. W. C. Grand, Chief Regional Manager, presided at the presentation of prizes and trophies by Mrs. Grand. The Henry Butt Bowl was presented to the Ilfracombe team, which secured the highest position in Class 2. A vote of thanks to the adjudicators, patients, and other helpers was proposed by Mr. R. Burgoyne, Regional Staff Officer, and to Mr. and Mrs. Grand by the captain of the winning team. The winners and runners-up went on to represent the Region in the British Railways and London Transport (Railways) National Competition at Central Hall, Westminster, on May 21.

Metrovick Contract for C.I.E. Diesels



(Left to right) Mr. D. Thomson, Secretary, and Mr. W. A. Coates, Director & General Sales Manager, Metropolitan-Vickers Electrical Co. Ltd., Mr. T. C. Courtney, Chairman, and Mr. F. Lemass, General Manager, Coras Iompair Eireann (see our issue of May 14)

Parliamentary Notes

British Transport Commission Bill

The British Transport Commission Bill, as amended, passed the Report stage in the House of Commons on May 17, and was read the third time and passed on May 20.

Questions in Parliament

Pullman Car Company

Mr. Gerald Nabarro (Kidderminster—C.) on May 19 inquired if the Minister of Transport & Civil Aviation would give a general direction to the British Transport Commission to discontinue their negotiations for the acquisition of the Pullman Car Company.

Mr. William Teeling (Brighton Pavilion—C.) asked a similar question.

Mr. Alan Lennox-Boyd replied:—I have no power to give such a direction, which I could not regard as one of a general character, and even if I had, I should not think it appropriate in this case. The proposal is the result of negotiations freely entered into between the B.T.C. and the directors of the Pullman Car Company, on the initiative, I understand, of the latter. The Directors have commended the proposal to their shareholders, and it is now awaiting the shareholders' decisions. The main reason which has weighed with the Commission in making their offer to acquire the Company is that they consider that this is the best way of ensuring the continuance of the Pullman car service on a sound long-term basis.

Mr. Teeling said that the Pullman Car Company during the whole period of the nationalisation of the railways before this Government took over was having considerable trouble, under considerable pressure, in carrying on its particular work, and he asked whether the Minister had no power whatever to do anything to stop this ordinary private enterprise company being taken over? The people in his constituency, to which most of these Pullman cars went, including the "Brighton Belle," would be horrified at this happening, because they did not wish to see nationalised railways taking over something that up to now had been so efficiently run.

Powers of the Minister

Mr. Lennox-Boyd said it was a fact that there were insuperable difficulties at the present time and in the foreseeable future for both parties to arrive at a worthwhile solution. He did not believe that anyone on either side of the House seriously expected that the powers given to the Minister under the 1947 Act should be used in this way to interfere with the Commission's freedom to make commercial transactions freely entered into by both parties. He hoped the advantages of the Pullman services, which were undeniable and which the Commission would continue in their present form, would be extended to other districts as well as to Brighton.

Mr. Ernest Davies (Enfield East—Lab.) asked whether the company had said that it could not carry on in view of the very large capital expenditure which would be necessary to re-equip these Pullman cars, and was that not the reason why it was being taken over.

Mr. Lennox-Boyd said it was not being taken over. The question was now before the shareholders, who had to consider a freely negotiated offer. It was for them to consider the matter, but clearly the immense cost of re-equipping a fleet, which

was getting old in parts and the franchise of which expired in 1962, must be ever present to the directors and the shareholders.

Mr. Teeling gave notice that he would raise this matter again next week.

Staff & Labour Matters

Dispute over Lodging Turns in Western Region

The unofficial strike of footplate staff on the Western Region of British Railways which commenced at Newton Abbot Motive Power Depot on Sunday midnight, May 16/17, has now spread to seven more depots—Bristol, Cardiff, Banbury, Severn Tunnel, Old Oak Common, Wolverhampton and Llanelli.

The stoppage of work is in protest against proposed new lodging turns of duty requiring footplate staff to spend a night away from their home. "Double home" turns were a recognised feature in connection with the rostering of train crews in pre-war days, but the system was suspended in many instances during the war. In consultation with the N.U.R. and A.S.L.E.F. proposals for the re-introduction of lodging turns have been made by the Management of British Railways.

These proposals were linked with a number of conditions:

(a) That men would not be involved in lodging turns requiring them to lodge within 75 miles of their home depot.

(b) Lodging turns in connection with the working of freight trains would be restricted to trains of certain classification and would exclude some of the slower moving freight trains.

(c) As far as possible lodgings for train crews would be provided in railway hostels, but where such accommodation was not available alternative approved arrangements would be made.

(d) Staff rendered surplus to requirements as a result of the introduction of lodging turns would retain their existing grade and rate of pay until work in their own grade became available.

Lodging Turns Agreed with Unions

The new lodging turns which are the subject of the dispute have all been agreed with the unions, the A.S.L.E.F. and N.U.R., and the action of the men in taking strike action is stated to be unconstitutional and directly opposed to the agreements entered into by their unions. Last week representatives of the strikers from Old Oak Common, Newton Abbot, and Bristol met union leaders in London with a view to explaining their grievances. They were advised that union agreements must be honoured and that there could be no negotiation until the men returned to work.

As the stoppage of work spreads in the Western Region there is evidence of some support in the North Eastern Region. A conference of railwaymen's representatives in York last week-end decided not to join the Western Region men in striking but they passed a resolution to the effect that whilst they regretted the necessity for taking unofficial action in the Western Region, they were convinced that double home turns were not in the best interest of either management or staff.

Attitude of A.S.L.E.F.

It is understood that a resolution for the total abolition of lodging turns was to be moved at the annual conference of the A.S.L.E.F. which opened in London on May 24. The York branch of the

A.S.L.E.F. has called a delegate conference on May 27 of all main-line depot branches in the North Eastern and Eastern Regions to consider support for the Western Region depots on strike.

The leader of the strikers at Newton Abbot has stated that he had telegraphed to Mr. Alan Lennox-Boyd, Minister of Transport, urging him to intervene in the dispute, but the Minister had replied that he was not prepared to negotiate with the strikers.

Meanwhile considerable dislocation of passenger and freight traffic is taking place as the strike continues.

Statement by Western Region

British Railways, Western Region, point out in a statement that a man may be required to lodge two or three nights in one week, and there would then be an interval before he takes up such duties again.

At the Paddington (Old Oak Common) Depot only two links out of 23 include lodging turns. The frequency with which the men of these two links have to lodge is, in one case, 12 instances per man in the course of 24 weeks, and in the other case 21 in 24 weeks. Therefore, on the average in the case of one link the man spends one night away from home in a fortnight, and in the other case the frequency works out at about one night away in 10 days.

Incidence of Lodging

The incidence of lodging varies at the different depots according to the circumstances, but it would be reasonable to assess the average frequency of lodging turns as being around 1 in 10.

Footplate staff, it is stated, do not necessarily continue indefinitely on turns of duty which involve lodging away from home. Moreover, the extent of lodging turns is quite insignificant in relation to the whole; in the aggregate they amount to less than one per cent of the total number of turns of duty of engine drivers and firemen.

Amenities at Old Oak Common

An indication of the amenities provided at Old Oak Common, described in our issue of March 25, 1949, is given in the Western Region statement. These are at the disposal of engine crews stationed at provincial depots whose job includes working trains to London and resting there before working their return trains.

The hostel is only 100-150 yd. from the booking-off point. Each man has his individual cubicle, furnished in modern style with interior-sprung mattress, and so on. Each block of cubicles is equipped with baths, shower baths, wash basins, with hot and cold water, and toilets. Clean sheets and pillow cases are provided. There is a drying room for wet clothes.

Hot meals can be served at any time of night or day. Men can make free use of the rest and reading room, recreation room, library, and hobbies room.

The premises are fully licensed, and there is a concert room where concerts, dances, and whist drives are held from time to time. Men on lodging turns accommodated at the hostel could participate in these events.

A call-board is provided on which men indicate the times at which they wish to be called for their next turn of duty. They can obtain a full-scale breakfast and, if desired, a packed meal for the return journey.

For the night's lodging and two meals the standard charge for a man on a lodg-

ing turn is 4s., i.e., 1s. for the cubicle and 3s. for the two meals. This charge is more than covered by the expense allowance which the man receives. The latter is based on a special payment of 4d. an hour from the time of booking on at the man's home station until he books off duty again at his home station up to 25 hr.; for the time beyond the first 25 hr. at the rate of 2½d. an hr., subject to a minimum payment of 6s. per lodging turn.

Accommodation is reserved at the Old Oak Common Hostel for about 30 men on lodging turns. In all there is accommodation for some 590 staff, mostly "permanent" residents provided for in this way because of the acute difficulty in obtaining private lodgings or houses for their families.

Industrial Court Award No. 2509 : Railway Shopmen

Sir John Forster, Chairman of the Industrial Court, has published his Award No. 2509, dated May 10, on a claim of the employees' side of the Railway Shopmen's National Council that railway workshop staff at present receiving leave with pay on two of the bank and public holidays a year should receive payment for additional bank and public holidays.

The claim was heard in London on April 29 and the Court has awarded that railway workshop staff at present receiving leave with pay on two of the bank and public holidays a year shall receive payment for a further four such holidays per year.

The award is operative from May 10, 1954.

Contracts & Tenders

Clyde Industries Limited, of New South Wales, has received an order for two 1,200-h.p. diesel-electric locomotives for the Kowloon-Canton Railway, Hong Kong.

Linke-Hoffmann-Busch G.m.b.H. is executing an order for 39 5 ft. 3 in. gauge bogie coaches for the Chilean State Railways.

The Soc. p. A. Antonio Badoni, of Lecco, has received an order for eight 45-h.p. diesel locomotives of 4,400 lb. tractive effort and a top speed of 18 m.p.h. for the Sardinian coal mines.

Ardeltwerke G.m.b.H., of Wilhelmshaven, Germany, has received from the Directorate of Ports & Railways, Mozambique, an order for a 65-ton 3 ft. 6 in. gauge breakdown crane for use on the Lourenço Marques system.

British Railways, Eastern Region, have placed the undermentioned contracts:—

Johnson & Phillips Limited, London, S.E.7: alteration of routes of and provision of fire protection to cables between Bethnal Green and Bow Junction, and provision of fire protection cables at Shadwell

Eagre Construction Co. Ltd., Seunthorpe: drainage and partial rebalasting of the permanent way between Elmswell and Haughley

The undernoted contracts have been placed by British Railways, Scottish Region:—

Ransomes & Rapier Limited, three diesel-electric cranes for Glasgow District

Walker Bros. (Wigan) Ltd.: one diesel-electric crane for Glasgow District

R. H. Neal & Co. Ltd., London: one diesel mobile crane for Glasgow District

Drummond Asquith (Sales) Limited, Birmingham: one horizontal boring machine for St. Rollox Works

T. Findlay & Sons Ltd., Mauchline: modernisation of station buildings at Newton-on-Ayr

The Special Register Information Service, Board of Trade, Export Services Branch, states that the United Kingdom Trade Commissioner at Madras has reported that the Government of Mysore Stores Purchase Committee, "Asiatic Building," Bangalore, is calling for tenders (Tender No. 12355), for the supply of platform wagons suitable for transporting rubble stones from quarry to workshop.

Capacity—15 tons gross (should be capable of conveying 10 tons of rubble)

Wheelbase—17 ft.

Journals—6 ft.

Platform dimensions—24 ft. by 6 ft.

Gauge—2 ft.

Sides—2 ft. high, hinged to open outwards similar to wagons conveying ballast materials.

The wagons should be complete with necessary buffer springs and couplings. The bottom and sides of the platform should be of sufficiently thick plates and suitably reinforced to stand rough use and fitted with suitable brakes.

Number required—14

Rates should be quoted per wagon for delivery F.O.R. Bhadravahi

Delivery from ready stocks will be preferred

Construction details should conform to the manufacturing Standards of the Indian Railway Board as applied to narrow-gauge wagons

The closing date for receipt of tenders is June 7. A set of the tender documents, including conditions of contract but not drawings, may be had on loan from the Branch (Lacon House, Theobalds Road, London, W.C.1.).

The Director-General of Supplies & Disposals, New Delhi, is inviting tenders for:—

18 crossheads, R.H. finished, machined suitable for double taper piston rods, for use on XA/1-2 class locomotives, to C.R. drawing No. MN (SP) 287 alt. 1 (D.G.I. & S. No. 3682/1)

18 crossheads L.H. as above to C. Rly. drawing No. MN (SP) 288 alt. 1 (D.G.I. & S. No. 3683/1)

2 crossheads, L.H. partly finished sizes suitable for locomotives No. 18 to 33, type NH1, NH2 and NH3 to indent tracing of No. MN(SP) 329 alt. Nil (D.G.S. & D. No. 9129)

2 crossheads, R.H. as above to C. Rly. indent tracing of No. MN(SP) 330 alt. Nil (D.G.S. & D. No. 9130)

2 crossheads, L.H. finished machined for locomotives Nos. 34 to 41 type MN to C.R. drawing No. MN(SP) 338 alt. Nil (D.G. & D. No. 9132)

2 crossheads, R.H. as above to C.R. drawing No. MN(SP) 339 alt. Nil (D.G.S. & D. No. 9133)

2 crossheads, L.H. partly finished sizes suitable for locomotives Nos. 42 to 45, type NH/4 to C.Rly. indent tracing of No. MN(SP) 331 alt. 1 (D.G.S. & D. No. 9131)

All items to I.R.S.S. No. M-2/48 class "A" Grade I.

Tenders are to be submitted to the Director-General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting reference SRI/16075-E/II and will be received up to 10 a.m. on June 8.

If the date for the receipt of tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their

own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

A copy of the tender form can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on application to the "CDN" branch and drawings can be seen at the offices of Hodges Bennett & Company, 59-60, Petty France, London, S.W.1, from whom copies may be obtained if required at a fixed price per sheet.

The Director-General of Supplies & Disposals, New Delhi, is inviting tenders for:—

20 Goodall drawbars complete for engine and tender for "NP," "YB" and "YF" class locomotives to Ex-B.A. Rly. drawing No. 2 P 40 (D.G.I. & S. No. 4757) and specification as shown on the drawing

Tenders are to be submitted to the Director-General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting reference SRI/16241-E/III and will be received up to 10 a.m. on June 11.

If the date for the receipt of tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

A copy of the tender form can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on applications to the "CDN" branch and drawings can be seen at the offices of Hodges Bennett & Company, 59-60, Petty France, London, S.W.1, from whom copies may be obtained if required at a fixed price per sheet.

The Director General of Supplies & Disposals, New Delhi, is inviting tenders for:—

(a) Six rods, eccentric, for "YG" locomotives

26 cranks, eccentric, for "B" and "P" locomotives

18 links, connecting for "B" and "P" locomotives

15 links, lifting, for "YF" locomotives

(b) 27,000 plungers

(c) Eight cast steel firehole doors

Tenders are to be submitted to the Director General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting references (a) SRI/16081—E/II; (b) SRI/16116-E/III; (c) SRI/1634/3-E/II, and will be received up to 10 a.m. on (a) June 9; (b) June 11; (c) June 15.

Forms of tender are only available for purchase in India from the Deputy Director General (Supplies), Directorate General of Supplies & Disposals, New Delhi; Director of Supplies & Disposals, Bombay or Calcutta; Deputy Director of Supplies & Disposals, Madras.

If the date for the receipt of tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

The Director General of Supplies & Disposals, New Delhi, is inviting tenders for the following manganese steel liners:—

960 pedestal shoe face liners
960 pedestal wedge face liners
1920 pedestal shoe side liners
1920 pedestal wedge side liners

Tenders are to be submitted to the Director General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting reference SRI/16240—E/1 and will be received up to 10 a.m. on June 12.

Forms of tender are only available for purchase in India from the Deputy Director General (Supplies), Directorate General of Supplies & Disposals, New Delhi; Director of Supplies & Disposals, Bombay or Calcutta; or Deputy Director of Supplies & Disposals, Madras.

If the date for the receipt of tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

A copy of this and the preceding tender form can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on application to the "CDN" Branch. Drawings can be seen at the offices of Hodges, Bennett & Company, 59-60, Petty France, London, S.W.1, from whom copies may be obtained at a fixed price per sheet.

The Special Register Information Service, Board of Trade, Export Services Branch, states that the British Embassy at Bangkok has reported that the Railway Organisation of Thailand, Bangkok, is calling for tenders (Tender No. BE 2497), for the supply of ten bogie heavy oil tank wagons and six bogie petrol tank wagons, fitted with all equipment and fittings.

Tenders in sealed envelopes, clearly marked "Tender for Bogie Tank Wagons BE 2497" should be addressed to the Stores Superintendent, State Railways, of Thailand, Bangkok. Documents in Siamese and English are obtainable from the Purchase Section, Railway Organisation of Thailand, Bangkok.

The closing date for the receipt of tenders is 2 p.m. on July 23. A copy of the tender documents, including specifications, drawing and conditions of contract, is available for loan to United Kingdom firms from the Branch (Lacon House, Theobalds Road, London, W.C.1.).

FUTURE OF PULLMAN CAR SERVICES.—Mr. Stanley Adams, Chairman of the Pullman Car Co. Ltd., stated last week that British Railways had no intention of changing the character and service of the Pullman cars. This was in response to many inquiries concerning the future of the company. "The well-known chocolate-and-cream livery of the cars, as well as the white Eton jackets and blue-striped trousers of the attendants," Mr. Adams said, "will continue to be 'on view' to the more than 1,500,000 passengers who use the Pullman Car services each year." The statement of the British Transport Commission of its intention that Pullman services over British Railways should continue as before, and that consideration should be given to their extension on other lines throughout the country, was recorded in our issue of May 14.

Notes and News

Draughtsmen Required.—Junior and senior draughtsmen are required by a manufacturing firm 30 miles north of London. Drawing office and workshop experience is required. See Official Notices on page 619.

Draughtsmen Required.—Applications are invited for the posts of draughtsmen required by Sentinel (Shrewsbury) Limited, Shrewsbury, for work on the design of 100 to 400 h.p. steam locomotives. See Official Notices on page 619.

Assistant Engineers for E.A.R. & H.—There are vacancies for Assistant Engineers on the East African Railways & Harbours. Applicants are required to have suitable professional qualifications and preferably some railway experience. See Official Notices on page 619.

Assistant Locomotive Engineer Required.—Applications are invited for the post of assistant locomotive engineer to assist in supervision of maintenance of a fleet of diesel-electric locomotives. Applicants are also required to have a thorough knowledge of steam traction. See Official Notices on page 619.

Railway Benevolent Institution.—At a meeting on May 19 the board of the Railway Benevolent Institution granted annuities to three widows and six members involving an additional liability of £165 14s. a year. Forty-six gratuities were also granted amounting to £509 10s. to meet cases of immediate necessity. Grants made from the casualty fund during the month of April amounted to £756 14s.

Whitsuntide Train Services.—The North Eastern Region of British Railways is to run 240 excursion trains and 241 relief trains during the Whitsuntide holiday. Of the excursions, 179 will be to the sea, including 43 to Scarborough and 39 to Blackpool. Excursions to inland resorts include 14 to Belle Vue, Manchester. There will be 15 special excursions to race meetings, seven of which will be to Wetherby, five to Redcar, two to Doncaster, and one to Stockton. Of the relief trains, 34 will be to London, 21 to Morecambe and Heysham, 16 to other destinations in Lancashire and the North-West, 23 to the Midlands, South Coast, and West of England, and two to the Eastern Counties. There will be 75 relief trains into the North Eastern area. Seats will be reservable on 94 relief trains and 59 will have restaurant, buffet or cafeteria cars.

Exhibition of Spheroidal Graphite Cast Iron.—An exhibition of mechanical components made from spheroidal graphite cast iron was held at Park Lane House, 45, Park Lane, London, W.1, on May 25, 26 and 27 by the Mond Nickel Co. Ltd. The equipment on view included, among others, bevel gears and pinions, rotary pump impellers, vacuum brake cylinders, a diesel-engine connecting rod, electric motor end shields and so on. By changing the graphite in cast iron from the flake to the spheroidal form, the strength of the iron is doubled, and its toughness increased by from four to twelve times, thus largely eliminating its brittleness normally associated with iron castings. The purpose of the exhibition was to demonstrate the properties of S.G. iron, which while having many of the best features of cast iron and steel, can readily be cast into complex shapes with a wide range of section thickness. Features of S.G. iron include high

yield point, good machinability, resistance to wear and corrosion, and, in the annealed condition, good ductility. There are some 35 licensees in this country engaged in the manufacture of this material.

Harwich-Hook of Holland Services Poster.

—The accompanying illustration shows a poster recently produced by the Department of the Public Relations & Publicity Officer, Eastern Region, from a design by Paul Mann. It features British Railways



Eastern Region poster showing trains and cross-Channel steamer on the Harwich-Hook of Holland route to the Continent

"Hook Continental" hauled by a class "7" 4-6-2 locomotive between Liverpool Street and Harwich Parkeston Quay, a cross-Channel steamer, and trains of the Netherlands Railways hauled by electric locomotives fanning out from the Hook of Holland to various destinations in Europe.

Prime Minister of Northern Ireland Visits B.T.H. Rugby Works.—On May 18 Viscount Brookeborough, Prime Minister of Northern Ireland, accompanied by Lord Glentoran, Minister of Commerce, and Mr. W. N. McWilliam, Assistant Secretary to the Cabinet, visited the main works at Rugby of the British Thomson-Houston Co. Ltd. The party was welcomed by Mr. E. H. Ball, Managing Director, Mr. W. W. Vinsen, Director of Manufacture, and Mr. H. L. Satchell (Director, Manager Rugby Works, British Thomson-Houston Co. Ltd. and other executives of the company, who afterwards accompanied the visitors on a tour of the works.

Engineering Wage Award and Selling Prices.—In a letter to all its customers Beckett, Laycock & Watkinson Limited states that it has so far absorbed all increases in wages and costs of the past year, there has been no general increase in its prices since early 1952 and many products have been reduced, but the situation is becoming increasingly difficult to maintain. The directors have decided, nevertheless, to make no general adjustment to the company's prices, being confident that this

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

YOUNG ENGINEERS required for setting out, etc. Experience on railway work desirable but not essential. Must have completed National Service. Apply Eagle Construction Co. Ltd., East Common Lane, Scunthorpe.

NOTICE is hereby given that The P & M Company (England) Limited seeks leave to amend the Complete Specification of Letters Patent No. 701,817 for an invention entitled Improvements in and Connected with Rail Greasing Apparatus or Pumps therefor. Particulars of the proposed amendments were set forth in the Official Journal (Patents), No. 3404 dated May 12, 1954. Any person may give notice of Opposition to the amendment by leaving Patents Form No. 36 at the Patent Office, 25, Southampton Buildings, London, W.C.2, on or before June 12, 1954.

LONDON TRANSPORT require temporary technical assistant; office of the Assistant Civil Engineer (Permanent Way); knowledge of permanent way design, drawing office experience, grounding in civil engineering, knowledge of mathematics, ability to use theodolite and level and make land surveys. Students of Institution of Civil Engineers preferred but young graduates without experience considered. Salary £343 10s. at 21 rising to £613 10s. subject to satisfactory service, with additional payments for certain recognised qualifications; medical examination. Applications to Staff Office (F/EV.281), London Transport, 25, Broadway, S.W.1. For acknowledgement enclose addressed envelope.

FOR SALE 550 tons approximately, good reliable original weight 95 lb. F.B. Rail with fishplates to suit. Apply Box 211, The Railway Gazette, 33, Tothill Street, London, S.W.1.

HER MAJESTY'S COLONIAL SERVICE. Applications are invited for the following posts:—**ASSISTANT ENGINEERS, EAST AFRICAN RAILWAYS AND HARBOURS.** Duties: Construction and maintenance of railway and port buildings, harbour works, etc., open line maintenance and improvements, surveying and construction of new lines and harbours. Appointment on probation for permanent establishment. Salary in incremental scale £650-£1,040 per annum plus temporary non-pensionable cost of living allowance of 35 per cent of basic salary. Free quarters or allowance in lieu. Free medical attention. Free passages. Generous leave. Candidates, who should be over 25 years of age, must hold a University Degree or Diploma recognised as exempting from, or have passed the Final Parts I and II of the A.M.I.C.E. examination plus at least two years' practical experience. Some railway experience is preferred but candidates with construction experience on other engineering projects will be considered. Full details on application. Apply in writing to the Director of Recruitment, Colonial Office, Great Smith Street, London, S.W.1, giving briefly age, qualifications and experience. Mention the reference number BCD/173/04.

DRAUGHTSMEN are required by Sentinel (Shrewsbury) Ltd., Shrewsbury, for urgent work on the design of 100 to 400 h.p. Steam Locomotives. These positions offer excellent prospects for men with the right technical background. The posts are superannuated and the salary range is attractive. Applications giving full details of qualifications and experience should be addressed to the Personnel Manager.

ASSISTANT LOCOMOTIVE ENGINEER required by the Steel Company of Wales Limited, Port Talbot, to assist in supervision of maintenance of an expanding fleet of Diesel Electric Locomotives. Applicants should have a thorough knowledge of Diesel-Electric and steam traction, from standpoint of both major overhauls, running maintenance and servicing, and preferably possess a degree or equivalent qualifications in Mechanical or Electrical Engineering. Those wishing to apply should write for official Application Form to:—The Personnel Superintendent, The Steel Company of Wales Limited, P.O. Box No. 3, Port Talbot, Glam.

JUNIOR and Senior Draughtsmen required by old established firm about 30 miles north of London manufacturing machine element essential for all classes of machinery. Drawing Office and workshop experience required, also technical training to at least O.N.C. standard. Please reply in writing giving full details of experience, age and salary required to Box 228, The Railway Gazette, 33, Tothill Street, London, S.W.1.

REQUIRED by the **NIGERIAN GOVERNMENT RAILWAY** for one tour of 18 to 24 months in the first instance. (A) **DIESEL ELECTRIC SUPERVISOR** (M2C/30564RA) and (B) **DIESEL MECHANICAL SUPERVISOR** (M2C/30565RA). Appointment either on contract terms with gratuity of £100/£150 a year and salary, etc., in scale £1,170 rising to £1,453 a year; or with prospect of pensionable employment and salary, etc., in scale £1,085 rising to £1,315 a year. Outfit allowance £30/£60. Free passages for officer and wife. Assistance towards cost of children's passages or grant up to £150 annually for their maintenance in U.K. Liberal leave on full salary. For (A) candidates, under 45 years of age, should have served an apprenticeship with a manufacturer of electric traction equipment or with an electric traction department of a railway, and have had at least seven years subsequent workshop experience in the overhaul and operation of traction equipment. For (B) candidates, under 45 years of age, should have served an apprenticeship on the manufacture of heavy diesel engines and have had at least seven years subsequent experience in the trade, including repairs work as well as new work. A knowledge of machine and fitting shop methods is necessary. Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote the reference number against the appointment for which application is made.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the **SUBSCRIPTION DEPARTMENT**, Tothill Press, Limited, 33, Tothill Street, London, S.W.1.

contribution toward maintaining stability is in the national interest. The continuance of this policy must depend largely on the degree to which the firm's own suppliers are able and willing similarly to absorb increases. Provided that the firm receives the greatest co-operation from them, customers are assured it will endeavour to avoid any general price increase; although the price of certain items must inevitably be revised these will be strictly limited and individually advised.

Brookes Motors Limited Jubilee Trains.—Nine dining car trains were run by British Railways—seven from Huddersfield and two from Barnsley—to carry 3,700 employees of Brookes Motors, Limited, of Huddersfield, and their friends to Llandudno for the firm's Jubilee celebrations recently. Breakfast and dinner were served on the trains, and the total cost to the firm was some £7,000. The first Huddersfield train left at 7.2 a.m. and the remainder at about 15 min. intervals. Return times spread from 9.44 p.m. to 11.42 p.m.

G. D. Peters & Co. Ltd.—The annual general meeting of G. D. Peters & Co. Ltd. was held recently in London, Lord Inverforth, C.P., the chairman, presiding. In his circulated statement the chairman said that the accounts for the year ended December 31, 1953, showed a net profit, after all expenses, but before taxation, of £178,065, compared with £187,476. Income tax and profits tax required £103,000 leaving £75,065. After bringing forward £58,768 the total was £133,833. It was proposed to transfer £3,652 to investment in subsidiary companies reserve and £52,000 to general reserve. During the year the acquisition of the Birmingham Machine Tool business of Timbrell and Wright (Successors) Ltd. was effected. The reorganisation of that company was in progress. The slackening in the demand for the firm's standard road and railway rolling stock

was reflected in their activities during the year, continued the chairman, though of late there appeared to be an improvement in their prospects. In the coming year it is clear that they would be faced with more intensive competition than in the past, coupled with rising labour costs.

Heavy-Duty Pulley Blocks—Richard C. Gibbons & Co. Ltd., of Birmingham, announce that they have manufactured and supplied to Babcock & Wilcox Limited four pairs of 6 x 6 sheave wire rope pulley blocks, each pair designed to lift 100 tons with 5 in. circumference wire rope. Each pair weighs 3 tons 7 cwt., and has been tested to 150 tons. The equipment is designed with grease-lubricated centre-pins, cast-steel sheaves with phosphor bronze bushes, and forged-steel oval swivel-eyes with anti-friction thrust washers.

No. 1 Movement Control Group R.E. (A.E.R.).—No. 1 Movement Control Group, Royal Engineers, Army Emergency Reserve, commanded by Major G. H. W. Wharton, R.E., has just completed a successful annual training camp at Harwich. Training took place from May 1 to 15, and personnel of the Group gained experience of rail and shipping transport at the Port of Harwich. Major R. N. Cloke, R.E., D.A.Q.M.G. (M) of the unit, directed the technical training, and the programme of military training was arranged by Captain H. P. Arnouts, R.E. Officers and other ranks of 1 M.C. Group, which was formed in 1951, are drawn from air, railway, road, and sea transport undertakings and agencies.

Oil-Filled Cable in Blackheath Tunnel, Southern Region.—The recent installation of a 30-kV. oil-filled cable for the Blackheath-Charlton Tunnel of the Southern Region presented a considerable problem. The tunnel, 1,681 yds. long, has little clearance between the walls and the running rails. Consequently there is inadequate

space for the joints necessary when normal production lengths of oil-filled cable are used for such long runs. It was therefore decided to cable the tunnel with three continuous runs of oil-filled cable each 1,725 yds. long. These cables, which are thought to be the longest continuous runs of oil-filled cable yet manufactured, were made by Pirelli-General Cable Works Limited in some extra large processing tanks at its Eastleigh works. The cables were paid out from drums mounted in railway wagons and laid in trefoil formation in precast concrete troughing along the foot of the tunnel wall. All three phases were laid at the same time, the operation taking approximately four hr. The three single hollow-core oil-filled cables are fed by one 225 litre normal pressure tank at the trifurcating joint position situated outside the tunnel at the Blackheath end. The Blackheath installation is part of the new 50-cycle frequency changeover scheme described in our March 19 and April 16 issues.

John I. Thornycroft & Co. Ltd. Interim Dividends.—The directors of John I. Thornycroft & Co. Ltd. have decided to pay the following interim dividends on account of the financial year ending July 31, 1954, less income tax, at 9s. in the £: 3 per cent on the cumulative preference; 3½ per cent on the participating preferred ordinary; and 5 per cent on the ordinary shares.

Flexi-Force Industrial Power Kits.—Epcor Limited, Star Works, Leeds 7, has recently evolved what are known as Flexi-Force industrial power kits, consisting of a manually-operated hydraulic pump which forces oil through a high-pressure rubber hose to a hydraulic ram. A wide range of attachments are provided which enables the equipment to be used for pressing on or removing pulleys, gearwheels, and ball-race housings from shafts, lifting machinery, and so on. The equipment is available

in two capacities, a 20-ton type for heavy duty, which includes chain and chain plate for pulling operations, bases and pusher head for pressing, spreading and lifting, and extension tubes and couplings for increasing the span of the main adaptors, and an eight-ton outfit, which consists of a pump, ram, and connection, together with various adaptors for industrial application. The hydraulic pump is of prefabricated steel, and the whole equipment is portable.

Associated Commercial Vehicles Limited.—The directors of Associated Commercial Vehicles Limited have declared an interim dividend for the year ended September 30, 1954, at the rate of 2s. per £1 unit of stock (ten per cent), less tax, payable on June 17, 1954.

The Brush Group, Limited.—The name of the parent company of the Brush Group has now been changed to The Brush Group Limited, from The Brush Electrical Engineering Co. Ltd. The name Brush Electrical Engineering Co. Ltd. has been given to the group's subsidiary company which manages the factory at Loughborough.

Metropolitan Railway Surplus Lands Company.—The group profit all attributable to Metropolitan Railway Surplus Lands Company, after deducting all charges, for the year ended March 31, 1954, is £75,179, compared with £62,692 for the previous year. Tax amounted to £114,044 (£95,560). A dividend of 5 per cent (4½ per cent) is proposed, absorbing £72,625 (£65,363). The amount carried forward will be £50,726 (£48,172).

Dorada Railway Co. Ltd.—The operating profit of the Dorada Railway Co. Ltd. for the year 1953 was £56,480, compared with £50,467 for 1952. Interest, dividends and other items totalled £10,532 (£10,512). Exchange adjustment took £23,155 (£21,166), debenture interest £9,703 (£10,071), depreciation of fixed assets £6,858 (£6,559), and subvention to subsidiary £29,600 (£17,500). Taxation in the United Kingdom was £53 (nil). The loss for the year was £2,357, compared with a profit of £5,683 for the previous year. There was no tax adjustment this year (£4,217), and the debit balance stood at £14,552 (debit £10,139). The Dorada Railway (Ropeway Extension) Limited had an operating loss of £38,500 (£47,268) for the year, and the debit carried forward was £142,174 (£140,079).

K. & L. Steelfounders & Engineers Limited Exhibits at Olympia.—Among the exhibits of K. & L. Steelfounders & Engineers Limited at the forthcoming Mechanical Handling Exhibition at Olympia, will be a new constructional crane, the Jones KL.75. The crane has a maximum load rating of 7½ tons, and a Perkins diesel engine provides the power for hoisting, slewing, derricking and travelling. The jib is of the firm's standard lattice construction, and can be assembled to provide working lengths of 25-, 45-, and 65-ft., and will normally be fitted with a 9-ft. 6-in. jury mast jib. Alternative jibs can be fitted for specific duties, one of which will be a 40-ft. swan-neck type, permitting a lift of two tons at 32-ft. radius, specially designed for handling prefabricated house sections. Other exhibits by the firm will include the Jones KL.15, 22, 44, and 66 types, together with a display of equipment, the theme of which will be the efficiency of the firm's

spares and servicing, operated from depots throughout the country. A comprehensive range of lifting and handling equipment on view will include Hoistmaster electric hoist models, hand winches, a light industrial overhead crane, and so on. The sole distributors for the company's products in the United Kingdom are George Cohen Sons & Co. Ltd.

Forthcoming Meetings

May 28 (Fri.) to May 30 (Sun.).—Institution of Railway Signal Engineers' Summer meeting at Utrecht, by invitation of the General Manager, Netherlands Railways.

May 28 (Fri.) to June 7 (Mon.).—British Railways, Southern Region, Lecture & Debating Society. Continental tour.

May 29 (Sat.).—Royal Engineers' Association, London Group. Second London sapper reunion, at the Duke of York's Headquarters, Chelsea, S.W.3, from 7 to 11 p.m.

May 31 (Mon.).—Indian State Railways. At the Rembrandt Hotel, South Kensington, S.W.7, at 7 for 7.30 p.m. Annual dinner.

June 9 (Wed.) to June 19 (Sat.).—Mechanical Handling Exhibition, at Olympia, London.

June 11 (Fri.).—Railway Club, at 82, Fetter Lane, E.C.4, at 7 p.m. Paper entitled "The Tallylyn Railway," by Mr. T. W. Robertson.

Until September 25 (Sat.).—"Popular Carriage" Exhibition (Two centuries of carriage design for road and rail) in the Shareholders' Meeting Room, Euston Station, London, N.W.1. Weekdays 10 a.m. to 7 p.m.; Sundays 2 to 7 p.m.

Railway Stock Market

Although at the beginning of the week sentiment in stock markets was affected by uncertainty about international affairs, and also by the rail strike, there was very little selling. Caution by buyers put British Funds and some industrials lower, but higher dividend news raised a number of shares to new high levels. The reaction in British Funds was due partly to reports of more Colonial and Corporation issues during the next few weeks. Another factor was the suggestion made in some quarters that, if sterling is made freely convertible later in the year, the bank rate might be raised again to 3½ per cent. for a period.

The prevailing assumption is, however, that industrial shares are likely to resume their advance. Many shares are in short supply in the market, and in the circumstances moderate buying could put prices up sharply. Despite the big gains in prices during the past few months, investors generally are showing little disposition to sell, although many brokers are advising that it would be prudent to take part of the profits shown on their holdings.

There has been rather more business passing in foreign rails. Buyers were about again for Antofagasta stocks, and the ordinary stock improved to 9½ with the 5 per cent preference changing hands around 41½, while the 4 per cent debentures were firm at 44 and the 5 per cent (Bolivia) debentures 67½.

Manila stocks were little changed following the announcement that the Manila Railway Company intends to go into voluntary liquidation to expedite distributions to preference and ordinary shareholders of available funds after payment of prior charges. The directors are of the opinion that, although a full assessment cannot be made at this stage, ordinary shareholders will receive not less than 9s. for each 1s. unit. The latter are quoted at 8s. 9d., the 5 per cent preference shares at 19s. and the "A" and "B" debentures at 144 and 137 respectively.

There has been a little buying of Nitrate Rails shares, which strengthened to 21s. 3d. Taltal Railway shares were 14s. 6d. Elsewhere, Dorada ordinary stock became less active and eased to 73 with the 6 per cent debentures again quoted at 90. Mexican Central "A" debentures were 73. United of Havana second income stock kept at 43 and the consolidated stock at 6½. San Paulo units changed hands around 3s.

News of the latest oil discoveries in

Canada tended to draw attention to Canadian Pacifics, which strengthened to \$43½. The 4 per cent preference stock was £65½ and the 4 per cent debentures £88½ xd. White Pass eased to \$24½.

Paraguay Central 6 per cent debentures marked 18 and the income debentures 8½. In other directions, Costa Rica ordinary stock kept at 9 and the first debentures at 62. Chilian Northern 5 per cent debentures were 26½, and Guayaquil & Quito 5 per cent debentures 51.

Midland Railway of Western Australia ordinary stock was 22, with the income debentures 42½. Emu Bay 4½ per cent debentures were 62½.

Among Indian stocks, Barsi remained at 122½. Nyasaland Railways 3½ per cent debentures were 79½.

Road transport shares held steady again with few sellers about. Southdown were 32s., West Riding 33s. xd. and Lancashire Transport 51s. B.E.T. deferred "A" units eased slightly to 45s. 9d. after their recent rise.

There was a moderate reaction in a number of engineering shares after earlier gains. T. W. Ward, for instance, after changing hands over 100s. came back to 98s. Babcock & Wilcox at 56s. were steadier on the news that the company will supply and erect the complete steam generating equipment for the atomic power station at Calder Hall, Cumberland. Guest Keen remained active on the view that acquisition by the company of its former steel interests will not require raising more capital, but at 57s. 7½d. the shares have not held best levels. Tube Investments were 65s. 6d. xd and the British Aluminium 36s. 9d. Vickers rose to the new high level of 61s. 9d. in response to the market view that there seem reasonable prospects of the dividend being 9 per cent for the current year on the doubled capital that will result from the 100 per cent share bonus. Ruston & Hornsby were 50s. 6d. and Thornycroft strengthened to 40s. 1½d.

Among shares of locomotive builders and engineers, Beyer Peacock have been firm at 39s. 9d. and Charles Roberts 5s. shares strengthened to 9s. 4½d. Vulcan Foundry firmed up to 24s. 3d., Gloucester Wagon 10s. shares were 17s. 6d., and Wagon Repairs 5s. shares 13s. 3d. North British Locomotive were 15s. 9d., while Birmingham Carriage were 26s. 10½d. and Hurst Nelson 42s.